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EDITORIAL

THE widespread interest in psychological topics which is one of the outstanding features of the intellectual life of to-day has been responsible for a great output of popular literature of very varying degrees of value and importance. Of this output an undue proportion has, from the nature of the case, been of a controversial or deliberately propagandist character—effective as a stimulative influence, no doubt, but not conducive to that just perspective which is essential to the advancement of any science.

Meanwhile much solid and valuable work has been done by professional investigators, although this has, unfortunately, been overshadowed, for the general public, by the more sensational doctrines of facile writers.

The time has now come when it may reasonably be attempted to effect a synthesis of old and new views, and, while satisfying the nascent demand for information about the latest developments, to utilise to the full the labours of more conservative workers.

Psychologists may well view with satisfaction this recent manifestation of public interest in their work, for it is only by a general realisation of the importance of the subject that they can obtain that moral and economic support which is essential to the successful prosecution of their labours.

At the same time, it is no less important that this interest should be directed towards the proper aims and based upon thoroughly reliable data.

The policy of *Psyche* is to provide a conspectus of all the most reliable views, while not ignoring more advanced and tentative developments on which opinion is still divided.

The field covered by modern psychology is a very wide one, so much so that there can be scarcely any class of the community to whom one portion or another of its subject-matter will not prove valuable, either directly or indirectly.

It has already been pointed out in these columns that the time has gone by when it was possible to regard Psychology as remote from practical affairs or concerned exclusively with intangible mental phenomena—unimportant because intangible.

It is now realised that helpful contributions can be made in the most diverse fields, as is, we think, sufficiently indicated by the varied contents of this issue. This is confirmed by the wide range of experimental work now being conducted in our Universities, work which no serious Educationist can afford to neglect. Medical men can scarcely fail to be interested in Dr. Lowson's article on Dreams, in Dr. Hartridge's views on Sleep and Insomnia, and in Dr. Prideaux's paper on Criminal Responsibility and Insanity. This latter is also relevant to Legal Practice, where Psychology is capable of many applications. Colonel Richardson's article on the Homing Instinct in Dogs presents many points of interest, not only for animal-lovers but also for soldiers and comparative psychologists. Mr. Dingwall emphasises the importance of special experience and knowledge as a qualification for the investigation of the problems of Psychical Research, with regard to which current opinion is so imperfectly instructed. Dr. G. H. Miles draws attention to the valuable work which is being done by psycho-physiologists in connection with the conditions and requirements of modern industry. The reactions of the human organism to conditions so unusual as those which obtain in Antarctic Exploration provide novel material for the general psychologist, while all who are interested in Æsthetics will welcome the clear exposition of Mr. Tudor Hart's remarkable discoveries in the realm of Colour and his striking rehabilitation of the analogy between Colour and Sound.

Finally, for the benefit of those unfamiliar with the rudiments of the subject, we have included a concise and lucid summary of accepted views by two authorities whose study of the ambiguities of language has enabled them to eliminate many obscurities which commonly detract from the value of introductory text-books.

So far as space permits, the columns of *Psyche* will always be open to correspondents who have matter of interest to communicate. Notes and news from foreign sources will always be welcome.

It is hoped that in subsequent issues our Literary Section will be enlarged to include all the more important British and foreign publications, many of which are reaching us as we go to press.

In this connection we would draw our readers' attention to the fact that we have made special arrangements, as announced at the head of our "Survey of Current Literature," whereby they may obtain all books mentioned in these pages and psychological literature generally with the minimum of trouble and delay.

THE INTERPRETATION OF DREAMS

By J. P. Lowson, M.D.

THE subject of dreams is a big and complicated one which raises questions of the greatest psychological interest. Freud in his latest book, *A General Introduction to Psycho-analysis*, devotes eleven chapters to the discussion of dreams, and books have been written about this subject alone. It would be absurd, then, for me to attempt to discuss dreams fully in the short space at my disposal, and I propose rather to confine myself to a few points of general interest. I want to show, first, that many dreams, perhaps all dreams, are capable of "interpretation," and second, I propose to illustrate some of the facts which make interpretation difficult. But first of all, since the word "interpretation" is ambiguous, we must settle what this word is to mean in connection with dreams.

For long ages mankind believed that dreams had a hidden significance, which men who were wiser or better inspired than their neighbours might be able to discover. Kings had their dream-interpreters who went with them to battle and advised them in peace. The rise of such men as Joseph and Daniel at the courts of Pharaoh and of Nebuchadnezzar is said to have begun through their skill in dream interpretation. At that time dreams were believed to contain a key to the future. Now in this idea there was an element of truth, as I hope to show later on, but still prophecy is not what is understood nowadays by the interpretation of dreams.

What is now meant may perhaps best be understood by contrasting it with two different views which had a certain currency in the last century. The first of these views was that dreams and the forms which they take were mainly matters of haphazard and chance dependent upon accidents of nutrition, circulation, and the like, in different parts of the brain; imagination was supposed to run hither and thither, planlessly, "like sparks in charred paper," wherever a little fuel remained. It is clear that on this view the course of a dream has little or no relation to the mental structure of the dreamer, to his past experience, his past or present interests or desires: on this view dreams are not, strictly speaking, mental products at all.

The second view was that dreams, or at any rate many dreams, were not haphazard in this sense, but were haphazard in another. It was supposed that they were due to the occurrence of some outer or inner sense stimulus which was represented in the dream. Thus an alarm clock might make a man dream of church chimes or of sleigh-bells, or cold feet might make him dream of snow, and so on. Now it does happen that dreams are started in this way. People who are thirsty dream of drinking, and I know a man who put his feet against a waterbottle that was too hot and dreamt that he was in hell. Against this view, therefore, there would be nothing to say, if it really accounted for all the facts. But it does not do so. In the first place, the sense stimulus is apt to appear transformed in the dream. The sounding of the same alarm clock gives rise to different images on different occasions, sleigh-bells at one time, chimes at another, the crash of breaking plates on a third occasion.[1] In the second place, a picture or even a succession of events rises round the sense stimulus and seems to have no relation to it, and this also remains to be explained. The stimulus theory, then, will not account for everything in the dream, even when a stimulus was undoubtedly present, and, besides, there are many dreams for which no stimulus is traceable. However, the point at present is that this view resembles the former view in one important respect. Here again the dream is left out of relation to the mental structure of the dreamer; the dream again becomes a haphazard product so far as the dreamer is concerned.

Now the view of dreams whose essence we owe to Freud—whether or not we agree with him on all points—stands in strong contrast to both these theories. It asserts that dreams stand in a most intimate relation to the mental constitution of the dreamer, and, according to this view, it is the discovery in detail of precisely this relationship which constitutes the interpretation of a dream. I wish to show how this view is justified, and how the form which a dream takes can be explained by reference to the dreamer's own mind. In this sense, if in no other, dreams have a meaning which is personal to the dreamer himself, throwing light upon his personal history, upon his most intimate thoughts, emotions and desires, and it is in this sense that I use the word interpretation in connection with dreams.

But how can dreams be supposed or shown to have a meaning of this kind? When one considers how senseless, fantastic and fragmentary many of our dreams are, full of preposterous occurrences which seem to take place without rhyme or reason, it appears absurd to say that behind all this lie definite relationships with our waking selves. Well, as a first step towards understanding this apparent contradiction, we may consider something quite similar which occurs apart from dreams and is familiar to everyone. Suppose you were shown a picture, a drawing, or imagine it, if you like, as a dream. Imagine a workman with a bag over one shoulder and an enormous haircomb nearly as big as himself over the other. Imagine him walking in a wood, for you see tree-trunks everywhere, though, curiously enough, they do not seem to have branches. The wood is full of holes in the ground, and in the holes and behind the trees are numbers of rabbits. You see how like a dream the picture is. Who but a lunatic or a dreamer would go out to catch rabbits with a haircomb, however big ? But now someone tells you that these holes are not ordinary holes but "funk-holes" ; that the trees are not trees but "posts," and, what is more, "government posts." You see how sense begins to appear out of the midst of absurdity. You understand why the man carries a comb ; it is "combing-out" that is represented. The picture is in fact a war cartoon—one of "Poy's" in the *Evening News.*

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[1] *See* Freud, *The Interpretation of Dreams*, p. 22.

Now some dreams are just like that. They become comprehensible at once when you get inside the dreamer's mind, just as the cartoon does when you get inside the artist's. In a favourable case, if you know enough about the circumstances of the dreamer, it is sometimes possible to understand a dream immediately. When one hears, for example, of a recently appointed teacher who dreams on the night before his first lecture that he has gone down to deliver it, and found the class-room in the first place packed to the doors with people, and in the second place so packed that he is quite unable to get in and is obliged to go home again, it is not difficult to see how the dream reflects the success which he naturally hopes for, and the shrinking from possible failure which he naturally feels, and neatly satisfies them both. Examples of this kind of cartoon dream are frequent enough in the literature of the subject. Take, for example, this dream from Dr. Maurice Nicoll's book: "I was hanging by a rope a short way down a precipice. Above me on the top of the cliff was a small boy who held the rope. I was not alarmed because I knew I had only to tell the boy to pull and I would get to the top in safety."[1] What was this precipice over which the dreamer was hanging, though he still believed himself safe ? The dreamer, Dr. Nicoll tells us, had begun to take morphia.

But, as we all know, the majority of dreams are not so simple as that—though, perhaps, even in dreams like these there may be more than meets the eye. In any case, many of our dreams are far more confused than these. What are we to make of them ? The best way, I think, is to give an example, and we may take the following dream.

The Dream of the Revolving Cab.—The dreamer here was a medical officer who was working at the time in a neurological hospital. The dream ran as follows :

"I was in Paris and the war was over. For some reason I was very anxious to remain in Paris. I heard that George Sand, who in my dream had written Balzac's novels, was in want of a private secretary. I thought I should like to apply for the job.

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[1] *Dream Psychology*, by Maurice Nicoll, p. 91.

"Next minute I was driving along Holborn in a cab with my uncle beside me, and I seem to remember the shadowy figure of my brother on the opposite seat. The cab turned to the left down a side street to draw up on the right in front of George Sand's house. But before it drew up a remarkable thing happened. Instead of pulling up directly at the door, the horse slewed round to the left, the whole cab skidded forwards and sideways, revolving through a half-circle, and drew up at the pavement in this reversed position. My uncle and I got out, the house door opened, George Sand stepped out on the pavement and entered into conversation with my uncle.

"Next moment I was standing in a quite different street, with houses all down the side that I was on, but no houses on the other side, only a river flowing along, and in my dream I knew that the river flowed from X—— [the place where the dreamer was at the time]. There were two changes of light in the dream. In Paris the light was bright though nothing was distinct; in Holborn the light was dull and dark; in the last scene everything was clear, the light was brilliant and the sky a beautiful blue."

What is the meaning of all this nonsense ? In this case we seem to have before us, not an isolated incident or a dramatic scene, but rather a kind of story told in a sort of picture-writing. How are we to find out what these pictures mean, if they mean anything ? We can only do so by finding out what they mean for the dreamer himself, just as we should have to ask the artist if we failed to understand a cartoon. But the trouble is that the dreamer himself does not know what the pictures mean. He says quite sincerely that they convey no meaning whatever to him. All the same, they came out of his mind and not out of anyone else's, and there, if anywhere, their explanation is to be found. It is Freud's method of free association that solves this problem for us. We ask the dreamer to sit quietly, think about his dream, and tell us without any reserve whatever, as they come into his mind, all the ideas that arise there in connection with it. In this way we reach the things, events and situations which turn out, in fact, to be linked in his mind with the dream images, and the meaning of the dream may gradually become clear, to him as well as to us.

This sounds a simple enough proceeding, but in practice, unfortunately, it is not so easy. The dreamer must not criticise his ideas as they arise. He must not say to himself as ideas arise, "This has no possible connection—it can't have anything to do with it," or, "That is quite absurd," or, "This other thing I prefer to keep to myself, or prefer not to think about." He must be perfectly candid with himself, and that is not at all an easy thing to do. Perhaps only those who have sincerely tried it know how difficult it is. However, when this method is applied to the case in hand, the dreamer does in fact get a crowd of associations drawn from his past life, which throw much light upon his dream.

It would occupy too much time to give you all these associations in their original order. The investigation of a dream may be a very lengthy business, occuying hour after hour. A dream may turn out to contain, in effect, all sorts of allusions to the past and the present. The process may remind one of what would happen if one were to attempt to follow up and trace to their origin the allusions which often occur in "family conversation," and remain unintelligible to the outsider. If such an outsider desired to trace an allusion, whose original source had been forgotten by the members of the family themselves, it is easy to understand that the associations, through which alone he could trace it, might follow a very devious route. I must confine myself, then, to the main upshot of the associated ideas which occurred to the dreamer in this instance—an upshot, it is to be noted, which he himself recognised.

Very quickly it became clear that in his mind Paris was associated with neurology, the study of nervous disease. After qualifying as a doctor he had lived and studied there, spending his working time in that branch of medicine, and proposing to specialise in it. His interest in that subject was again a development of a still earlier interest acquired before he had anything to do with medicine at all—strongly rooted, therefore.

Now the dreamer did not, as a matter of fact, "specialise"; before the war he was in general practice. Perhaps, then, we shall not make too wild a shot if we assume provisionally that the first part of the dream runs in this way: during the war the dreamer has been following his favourite professional pursuit; when the war is over he wants to continue it and not to return to general practice.

But next minute he finds himself in Holborn driving with his uncle. What does this mean ? The dreamer tells us that in fact on leaving Paris he went to London, and worked in a hospital in the neighbourhood of Holborn, a street which he used to cross every day. But at this point he began to meet with difficulties in the execution of his projects, which made him afraid that he would have to abandon this interest. in favour of ordinary practice. These difficulties were not connected with his work itself, but they were none the less real and pressing for that. At this point his uncle comes into the story with a rather startling offer to take a house for him in London and finance him for some years until he has had time to find his feet. This offer the dreamer felt it necessary to refuse, and his refusal brought the whole matter to a head. He solved the question once for all by abandoning neurology and entering general practice, thus reversing, as it appeared to him at the time, the whole current of his professional aims. A somewhat painful difference with his uncle followed, in which his brother was concerned.

There were many other associations in this connection, and in the light of these facts it is not difficult, I think, to see what the main current of the dream is. The dreamer is in fact working over his past life. He is again in London, he is again driving towards his previous aims, his uncle is again backing him, and, further, he is again reversing the direction of his previous life, but this time changing back again from general practice to his special pursuit. Accordingly the cab reverses as they draw up at the door of the house in London—the central point in the dream.

Finally the dreamer finds himself in a street which recalls the street in which he used to practice. But the street is changed. Half the houses are gone and in their place flows a river which comes from the town where he now is, which has its source in the work he is now doing.

If I could give all the associations, the light would be still more evident which they throw both upon the dream itself and upon the life and interests of the dreamer. It would be seen also how much personal ground we managed to cover in seeking the meaning of a single dream, and yet the account I have given of it is by no means exhaustive. George Sand still remains to be explained, and the reference to Balzac's novels, but the interpretation of these would take us too far into the personal history of the dreamer and cannot be given here.

I think the meaning which I attach to the word "interpretation" is now clear. A dream is capable of interpretation when it has definite relations to the mind of the dreamer; when, that is to say, the dream images and the form which they assume can be shown to follow, not physiological or external accident, however determined, but the lines of the dreamer's own character, interests and experience. Conversely the display of these relationships, and the light which they throw upon the dreamer's mind, constitute the interpretation of the dream.

I said at the beginning that there was a grain of truth in the early idea that dreams throw light upon the future. It is easy to see why that is sometimes so. The future of any man is in part determined by his mental constitution, and by the desires, conscious or unconscious, which are among its most important features. Take the last dream, for example. It was what is sometimes called a "resolution dream." My friend is now as a matter of fact practising neurology.

I think, then, that it is fair to conclude that some dreams at any rate can be interpreted in the way I have sketched, and that in this way light can be thrown upon the history, the character, or the motives of the dreamer. This is just as true of the dreams of three thousand years ago as of the dreams of to-day. If one thinks of the dreams of

Joseph recorded in Genesis, for example, the dream of all his brothers' sheaves bowing down before his, and the still more grandiose dream of the sun, moon and eleven stars bowing down before him, one sees that they throw light, not only upon the reasons why his brothers put him in the pit—they had no hesitation about interpreting his dreams—but also on the qualities of character which are said to have taken him to the head of the Egyptian administration.

But the question naturally arises at this point: If dreams have this kind of meaning, why is it that the dreamer is usually unable to interpret his own dream? This is the second point which I wish to take up.

The answer to this question is not a simple one. It is probable that a number of causes, not all of which are thoroughly understood as yet, join in producing this effect. But there is one cause of dream "distortion," upon which Freud and his fellow-workers lay great stress, which for practical reasons deserves immediate mention.

First of all, Freud points out that many dreams—in his opinion all dreams—are wish fulfilments open or disguised. The satisfaction or attempted satisfaction of some desire or craving is an obvious character of many dreams. It is very evident in some of the dreams of young children, and in the dreams of explorers about food, drink and tobacco. These are dreams which deal with admitted wants which have remained unsatisfied by day. I recollect once, when I had good reasons for being anxious to get home on leave, and had remained in doubt for over a week as to whether I should be allowed to go or not, I partially woke in bed one morning long before my usual hour with a feeling which most of us probably know: that nasty feeling of having "something on your chest"—the feeling that something is wrong somewhere, though for the moment you can't say what. Next minute I was dreaming that I stood in the hospital ward, where a man I knew came up to me and said, "Here, I've got something for you," and pulled my leave-warrant out of his pocket. I felt at once quite happy and satisfied, and went sound asleep again. It is, as Freud says, one of the functions of the dream to protect sleep against disturbing thoughts and feelings.

But granting that many dreams are wish fulfilments, how does that throw light upon distortion in dreams? The answer is that there are few men whose minds are not divided, few men whose desires do not conflict with each other to a greater or less extent. Some of us, no doubt, have better desires and some of us have worse, but we can all recognise—if we are honest with ourselves—that wishes actually exist within us which are not in line with our better selves. Now it is especially in sleep, when our power of self-control is somewhat weakened, that these wishes are apt to get the length of expression. But our higher or better adjusted selves with their controlling desires are not altogether asleep, and the open expression of some of our inborn or acquired tendencies would still be painful to us. Hence the conflict between the desires involved is represented in the dream, which is often a compromise between them, and the expression of our evil, or it may be merely our improper wishes—as we should call them in waking life—becomes distorted beyond recognition, "censored," as the term is. The expression of our better desires may be of course distorted also. The following dream may be taken as an example of this kind of distortion.

The Dream of the Uninvited Guests.—The dreamer here was a university lecturer. The dream ran as follows: "I thought I was upstairs in my house when the maid came and told me there were some gentlemen to see me. I went downstairs and found half a dozen men sitting in a circle round the fire. They were in full evening dress—dress coats, white ties and white waistcoats. I went and stood in the middle in front of the fire. I didn't know one of them, and couldn't think who they were, but I concealed my ignorance, and presently it came out, to my dismay, that they had all been invited to dinner. I rushed upstairs to my wife and asked her advice. She suggested that I should take them to a hotel. Accordingly I went down and suggested this, and we all went to a hotel, where we had a very good dinner.

"When dinner was over I passed round the cigarettes hoping that they would now go away. But not a bit of it! They hung on, and at last I proposed going back to the house. They seemed delighted and came along. Back in the house, however, one of them suddenly addressed me as 'Mr. A.' I turned to him and said, 'Do you suppose me to be Mr. A.?' 'Of course!' 'Do you all take me for Mr. A.?' 'Yes, of course we do.' 'Were you invited to dine with Mr. A.?' 'Yes.' 'Then how did you find your way here?' 'We asked a man at the street corner and he told us it was here.'"

The interpretation of this dream is not difficult, though it would not have been possible to establish it without the co-operation of the dreamer. There was both a resemblance and a difference between the position of the dreamer and that of Mr. A., a resemblance in their official duties, a difference in the degree of their popularity, and in the influence which they exerted. In a word, A. had achieved a reputation, and attracted many students round him. The dreamer's position was different, and might be imagined by the dreamer himself as just the contrary. In the dream he takes A.'s place (not to speak of spoiling his dinner-party), and from this point of view the dream is a wish-fulfilment. But why should his wish to have A.'s position not get open expression in the dream? To ask this question is almost to answer it. In ordinary life the dreamer was far from being a small-minded man; he was proud, and he was not conscious that he envied his rival. He had a private and not too exalted opinion of him (not quite unjustified, perhaps), but he certainly would have done nothing deliberately in order to undermine or replace him. In the dream the wish-fulfilment is accordingly distorted. He is in the dark all along as to what is really happening, and even when light breaks through at the end he does not recognise its real significance.

It is this side of the subject which leads on to dream-analysis in the strictly Freudian sense. Freud's method of attacking dreams is to take the dream bit by bit, getting the associations to each element separately. In this way, it is possible to work out tendencies actually present in the dreamer's mind and concerned in the dream, but not clearly expressed in it because of their disagreeable character—because of their conflict with the rest of the personality. These are the tendencies which, in Freud's language, belong to the unconscious and have succumbed to the " censor " in the dream. Some of Freud's followers would deny, I think, that what I have been describing is " analysis " at all, and from a medical standpoint this would be natural enough. For until recently medicine was entirely concerned with the things which upset the body and the mind, and not with the things which maintain them in health.

This leads me to remark, however, upon another very interesting character of dreams in general. The desires whose satisfaction the dream seems to attempt are not always very creditable ones. We have just seen in the dream last cited that the underlying feeling was not one which the dreamer would have consciously permitted to influence his waking actions. And yet this dream is a mild sample compared with dreams which are common enough. "Desires," says Freud, "which we believe to be far from human nature show themselves strong enough to rouse dreams. Hate expends itself without restraint. Revenge and murderous wishes toward those standing closest to the dreamer are not unusual, toward those best beloved in daily life, toward parents, brothers and sisters, toward one's wife and children. These censored wishes seem to arise from a veritable hell; no censorship seems too harsh to be applied against their waking interpretation."

Perhaps the mode of expression used in this passage may strike us as a little " over determined "; but however this may be, Freud is not usually assailable on the side of facts observed, and we had better admit the truth of this statement of fact, though if it were theoretical it might be otherwise. But in any case we want to know why dreaming and waking life are so different. Freud himself supplies the answer. Dreams are to some extent the distorted expression of primitive desires and "ideas," and part of the reason for the apparent distortion is that these desires sometimes bring with them a primitive form of expression, which makes the dream still more difficult to understand. That is the third point which I wish to make.

The word "primitive" may refer in this connection either to the development of the individual or to the development of the species. On the one hand, it may refer to the primitive period in individual history—to childhood; on the other, to the still uncertain characters of those early forerunners of man as we know him now, and their successors, from whom, presumably, we have evolved by a process of continuous descent. It is probable enough that both these periods have not a little in common with each other, not only in point of those characters which we recognise as essential to human nature, but in point of characters which have become obscured in human nature as we know it at present; still we must keep the distinction between them in our minds.

In our dreams tendencies from the first, and perhaps from the second of these periods, may lead again a distorted life. Primitive desires long suppressed may revive, or primitive impulses long since involved in, and controlled by, higher modes of activity, may break loose, as it were, and lead again for a moment an independent life. Primitive pugnacity and cruelty, for example, might appear out of a sentiment of more or less righteous indignation, within which they had been confined and controlled to proper ends. The righteous man might find himself treating his enemy in a dream as he would be ashamed to treat him in waking life. Of course a chief part of the practical value of dream-analysis consists in its rather relentless exposure of our unconscious hypocrisies, forcing us to recognise the real nature of some of our motives, or the nature of the underlying motives, which are often hidden within those which are apparent, and influence our conduct without our being clearly aware of them. But still we should often find ourselves in error, if we reckoned base, murderous, meanly envious, or meanly revengeful motives as part of the effective character of a reasonably self-controlled man, when they appeared solely in his dreams. The germs of such impulses are probably common to the vast majority of men, but conduct is foretellable only from a knowledge of a man's effective character taken as a whole. Still, the impulses which come to light in dreams are often strange and sometimes very unpleasant, and this is a fact which it would be foolish to deny.

I think it may help in getting the right point of view in this matter —and I think it is important that we should get the right point of view —if we consider the following passage from Mark Twain, a writer who certainly knew something about boys. He is describing the doings of a number of boys, about ten or twelve years old, who had found a cave that no one else knew of, a secret place where they could do as they liked without fear of disturbance. They collected there, needless to say at night, for the purpose of founding a gang of robbers. The scene is described by Huck Finn, a humble member of the gang:

"Tom Sawyer says: 'Now we'll start a gang of robbers and call it

Tom Sawyer's gang. Everybody that wants to join has got to take an oath and write his name in blood.' Everybody was willing (the passage goes on cheerfully). So Tom got out a sheet of paper that he had wrote the oath on and read it. It swore every boy to stick to the gang and not tell any of the secrets; and if anybody done anything to any boy in the band, whichever boy was ordered to kill that person and his family must do it, and he mustn't eat and he mustn't sleep till he had killed them and hacked a cross in their brests, which was the sign of the band. . . . And if anybody that belonged to the band told the secrets, he must have his throat cut, and then have his carcase burnt up and the ashes scattered all around, and his name blotted off of the list with blood and never mentioned again by the gang, but have a curse put on it and be forgot for ever.

"Everybody said it was a real beautiful oath. . . . But some thought it would be good to kill the *families* of the boys that told the secrets. . . . Then Ben Rogers says: 'Here's Huck Finn, he hain't got no family—what you going to do 'bout him?'

"They talked it over and they was going to rule me out, because they said every boy must have a family or somebody to kill. I was most ready to cry; but all at once I thought of a way, and so I offered them Miss Watson—they could kill her." Which settled the matter.

No one will deny that these proceedings were rather bloodthirsty. We have here a set of ideas which in grown men would be nothing short of horrible. No one will deny either, I hope, that they were perfectly natural. Yet unquestionably boys indulge in ideas of this kind for the sake of the real satisfaction which they get out of them. The ideas have what is sometimes called—rather loosely—"psychic truth." They are imaginary, but the satisfaction which goes with them is not.

Dreams certainly offer us opportunities of which this primitive side of us is quick to take advantage. The natural man, who is in some respects very much the natural boy, runs strong in them, especially those parts of him which give us most trouble to control or keep under. There is a kind of parallel, which is not without interest, between dreams and a certain sort of literature. If one gives names to dreams it is surprising how many of them would head a magazine story with credit, or even grace the cover of what used to be called a "shilling shocker." The sensational novel contains, in fact, a mixture of mystery, blood and omnipotence on the part of the detective—with whom the reader identifies himself, consciously or unconsciously—which appeals to the boy and the primitive man who lie hidden in all of us.

Childish reminiscences and childish satisfactions still wake and play their part in literature and dreams. One instance of this, as Freud believes, is the common dream of finding oneself in a public place very insufficiently clad. You are at a party, say, and suddenly find that you have nothing on but your pyjamas, or even less than that. This is often accompanied by a curious inability to use your feet, which increases your embarrassment. They seem to stick to the ground or weigh about half a ton each, preventing you from getting rapidly away. There is something in you, then, not unwilling to prolong the situation, for in dreams what is there to prevent one except oneself? What is this something? It seems probable that it is just that naïve desire for admiration which is so evident in early childhood, and so often takes the form of undressing or of appearing undressed more or less in public. We know how children dance about and enjoy running from one room to another when they have their night-things on. We know how they ask their friends to come and see them in their baths—or sometimes, conversely, won't on any account permit it. This is the unconscious satisfaction which the dream of nakedness repeats, but it is checked and spoilt by the feelings which later training (and perhaps inheritance) has very properly implanted in us. If we feel inclined to object that it is absurd to suppose that so childish a tendency should retain enough strength to influence the dreams of later life, we are reminded of two facts: first of the tendency which the insane not infrequently show to strip or attempt to strip themselves upon the street; and next of the stress laid on the nakedness of Adam and Eve in the first chapter of Genesis, a myth which symbolises the childhood of the race. You remember how Adam and Eve had no clothes and did not mind it at all. Because a mental disposition, a way of thinking, feeling or acting appears childish and absurd to our more developed minds, it does not follow that it has not an interesting and even an important origin in our own or in the race's history; just as there are parts of our bodies, and processes which go on in our bodies, which seem of little or no use to us at present, but still repeat themselves nevertheless, coming up generation after generation, often as necessary steps leading up to our fully developed structure.

I am afraid, however, that I have not left myself space to do more than refer to those most interesting characters of dreams, which, while they still farther estrange them from our waking thought, suggest even more definitely some kind of regression or reversion in sleep to primitive racial conditions. Not only do primitive desires revive, which after all are still present with us in some shape or other in waking life, though we may not recognise them, but there is a suggestion that primitive ways of thinking and primitive ways of expressing thought may revive also. Consider, for example, the way in which our dreams unconsciously confuse resemblance with identity. Let two persons resemble each other in some respect which has an interest for us, and in our dreams we substitute the one for the other and treat the substitute as we would treat the original. Compare with this a magic practice common in the past: the making of a little figure to represent your enemy. You stuck pins into such a figure, heated it before the fire, and so on, and you expected or hoped that disease or death would follow in the person whom the figure represented, because of the resemblance. Or again, a young child will sometimes develop the habit of throwing things out of the window when there is a person in the household of whom he wishes to get rid. I do not say that it is always for this reason, but it would seem that it sometimes is. After all, the impulse to symbolic actions of this kind is not altogether unknown among grown people.

In this connection the frequent occurrence of parallels between dreams and the behaviour of children, dreams and superstitions, dreams and fairy-tales, dreams and myths, raises questions of great interest, though we cannot say that we have got the right answers yet. Freud first pointed out that there are symbols, ways of representing ideas, or unconscious connections between ideas, which are found in the dreams of different nations, and not only in dreams, but in myths, legends, and the structure of languages. These universal symbols, as we may call them, seem at first sight so inexplicable, and some of them are so odd, that one is inclined at first to doubt their existence; but experience obliges us to recognise that they do exist. The symbols in question seem connected in the main with three great human interests: birth, death, and the attraction between the sexes. To this day births, deaths and marriages are the three private events which we all put on public record. In dreams there are many symbols of this kind in the special case of the sexual relation, but in the case of birth and death the symbols are fewer and more simple. Take birth, for example.

"Birth," says Freud, "is almost regularly represented by some reference to water: either one plunges into the water or climbs out of it, or is rescued from it." This is curious enough—not that there is no connection between the ideas, but that this connection should be picked out in dreams—but we can note the same association, not only in dreams, but in art and poetry, and in the myths and legends of long ago. When Whitman writes a poem about the sea he calls it "Out of the Cradle Endlessly Rocking," and he speaks of the sea both in this and another poem as "The fierce old mother endlessly crying." One remembers the French picture, "La Source," a girl holding a pitcher of water on her shoulder. In the heroic legends the hero's story often begins, as Freud points out, with exposure in the water and rescue from the water, as in the case of Œdipus the Greek or Moses the Hebrew hero. In mythology Venus is born from the sea. Perhaps these examples are enough to show the sort of parallelism which obtains in the case of certain dream-symbols, but they are by no means the only ones which could be given. Most of us do not think in biblical symbolism when we are awake, and yet we do in our sleep, where the image of a house or part of a house is a common symbol for the human body. Perhaps the most striking thing about these symbols is their seeming occurrence in the dreams of young children.

Their origin is still unsettled. The question is whether they are a consequence of the uniformities of human experience, acquired therefore by different people in the course of their lives, or whether they are, in some sense, inherited. Freud, as I understand him, for his language is not always clear, believes that they are inherited.[1] His experience is large and his opinion is entitled to respect. But most people would hesitate, probably, to accept this view, before other explanations have definitely failed. We must admit that as yet we have not fathomed all the recesses of our dreams.

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[1] "Not alone have all land animals . . . developed out of water animals . . . but every single mammal, every human being, has lived the first part of his existence in the water. . . . I do not wish to maintain that the dreamer knows this; on the contrary I hold that he does not need to know." (Introduction to *Psycho-analysis*, p. 132.)

THE PSYCHOLOGY OF EXPLORATION

BY MAJOR R. E. PRIESTLEY

[*Psychology, like other biological sciences, derives its material largely from observing the reactions of abnormal individuals in ordinary environments, but the behaviour of normal individuals under exceptional conditions is not less instructive. The recent war provided us with abundance of material of the first variety, whereas observations of the second type are far rarer and more difficult to obtain. This lends especial interest to Major Priestley's unique account of the effects of Antarctic hardships on the minds of his fellow explorers.*—EDITOR.]

PART I.—ANTARCTIC

FOR the convenient study of the character reactions of a modern Antarctic expedition, it appears desirable to divide the expedition up into several distinct phases. Starting with what is the real beginning of the adventure, these may be tabulated as follows:

(*a*) The voyage south from civilisation.
(*b*) Winter and summer at winter quarters.
(*c*) Spring and summer sledging.
(*d*) The catastrophic phase. (May or may not occur.)

The arrival of the expedition in truly Antarctic seas is signalised by the passage through the "pack," an ice-girdle which surrounds the South Polar continent in about the latitude of the Antarctic circle and which is formed of the sea ice of preceding winters with a liberal admixture of icebergs. Of this little need be said until the consideration of the catastrophic phase of the expedition. One's initial experience of it is pure joy. The change from the stormy Southern Ocean and the blustering westerlies to the calm sea and bright weather of the Antarctic summer serves but to renew and to intensify a feeling of exaltation, first engendered by the fervency of the send-off from New Zealand and now raised from height to height by a combination of exhilarating climate and the approach to new land. This is one of the "heights" of a polar voyage, when all one's comrades are one's bosom friends, and when every single experience is viewed through rose-coloured spectacles.

Once the pack is passed the opportunity comes to translate this fervour, born of high resolve and anticipation, into the ordinary coin of hard work. Landing days are few, even in the Antarctic summer, and a week or two of twenty to twenty-four hour days shatters all trade union rules and brings to earth some of the least well-fitted of the ship's company. I have seen a man so exhausted that he slept head down, with his legs going up and down, up and down, on the cross-head of the piston of the ship's engine. I have trodden on the hands of another scientist who slept standing on the almost vertical gangway leading down into the engine-room. A muttered curse and a slight change of position was the only result in the latter case: in the former, I was myself too utterly tired to adjust the legs to a less fantastic and uncomfortable position. I have myself slept extended at full length in a gangway in which some three to four inches of slushy water washed about, and have remained supine—literally too tired to move—while one after another of my comrades have stumbled over me on their way in or out of the filthy hole which served us as a cabin.

In this phase an expedition has, at the outset of its Antarctic life, a good example of the periods of intense labour, followed by untrammelled relaxation, which are a characteristic of a good part of its stay on the polar continent. Nowhere does contrast play such a dominant part in characterising environment. It is to this contrast, I believe, that half the fascination of polar exploration is due, and I shall have more to say of this later.

Normal winter and summer life at headquarters in a modern expedition show very many fewer points of interest in the present connection than did the same life in former times. It has been lifted almost out of the plane of the unusual. The outfitting of expeditions has progressively improved. Scurvy has disappeared as a menace to comfortably housed and scientifically-fed communities. A good library; a sufficiency of work; a community of interests; a variety of experience; a considerable but elastic measure of discipline, combine to render the polar winter increasingly ordinary. The weakness of an empirical method still largely indulged in in selecting explorers, occasionally betrays itself in the formation of cliques or in individual outbreaks, but the strain is not great and these are decidedly the exception and not the rule.

One's conscious life is normal and one's dreams are much as they are at home. This latter fact is interesting in view of what may happen under different circumstances.

The Antarctic winter, while it is mollified so much by the comforts of the modern explorer, is itself nevertheless a dominating feature of environment which deserves more notice than I have time to give it. The frequent blizzards with their gusts of over one hundred miles an hour; the frigid temperatures which reached in our experience no less than 109° of frost; the weird scintillations of the Aurora Australis lighting up an otherwise pitch-black night, are all factors to be reckoned with when man is exposed directly to their influence. Normally, however, work outside is confined mainly to the scientist who can, at any rate, make believe to himself that he can explain every weird light he sees and every strange sound he hears. I have, however, myself been impressed against my will and my reason by the sighing and sobbing of the ice-pack and the gurglings, blowings and snortings, mayhap of seals, perhaps of more obscure origin. It is told of quite recent expeditions that sailors working in the dark have incontinently flung down their picks and shovels and have refused to leave the ship again without companions. This has not happened within my own experience, but I can well believe it. The effect under sterner conditions when things have gone awry must be immensely reinforced, and it is likely that this factor plays a potent part in the inception of the peculiar madness which has played a major or a minor part in most expeditions that have undergone hard times.

Summer at winter quarters may be passed over in very short order. This season is usually occupied in the sledging which forms the subject of my next section. For those who remain behind with specific tasks, for which they are fitted by experience and temperament, the Antarctic summer is a period of pure pleasure. The strain of the winter—such as it was—is over, and the absence of their companions is as yet quite normal and according to plan. A varied animal life adds to their interests, and the psychology of the penguin in particular is an absorbing study to more than the official zoologist.

The isolation of a whole expedition from the rest of mankind in itself makes it a fruitful field for the trained psychologist. If this is admitted, it will probably be agreed that the problem of dealing with the reactions affecting the small sledge party of three to six men will be still more interesting because more simple.

The composition of the party is usually somewhat standardised, the essentials of a small geographical sledge team being a navigator, a scientific observer, and a "handy" man who can keep the essential gear in order. In some cases the combination of the first two qualifications in one personality will leave room for the inclusion of two men chosen for their more general suitability. In other cases, men take their place in the party by right of some specialist qualification, as for instance, dog-driving, horse-mastership, ski-ing, or even art.

In no way is leadership better shown than in the selection of the individual sledge teams. Certain essentials must be complied with, as hinted above, but, given the satisfaction of these, good leadership will be shown in the arrangement of the teams in terms of temperament and association.

Compatibility is as essential in a sledge team as in the case of a marriage partnership. The result of incompatibility is certain to be constant friction. That of marked incompatibility is likely to be sudden death, a worse contingency by far than divorce, and one that is irrevocable. It is here that a wise leader may make some use of the cliques which, if they have existed, have hitherto been a thorn in his side. Not only will the members of such natural coteries be likely to agree, but a healthy rivalry may convert a source of danger into an element likely to assist to achieve success. The desire to prove equal in physical prowess and endurance to jealously-regarded rivals will spur many men on to unexpected feats, while in a party of bosom friends the slack trace is unlikely to be seen and will be least likely to be imagined.

The special factors of the environment of a sledging party which are most likely to bear hardly upon its members are perhaps as follows:

(1) Sledging hunger and occasionally thirst.
(2) Lack of sleep due to the intense cold of winter or spring sledging.
(3) Monotony of colour, of occupation and of companionship.
(4) The gruelling nature of the work. (Man-sledging only.)
(5) The impossibility of getting away from one's companions.
(6) The dangers peculiar to particular types of sledging.

There are many lesser factors which enter into the equation of life under sledging conditions, but each of the above have some effect upon the conscious life of the individual, while the first in particular reacts upon his sub-conscious self and finds vivid expression in his dreams.

First in order I have placed "hunger and thirst." Not because they are necessarily of primary importance, but because their effects are perhaps best known from the published records and because they are comparatively uncomplicated by other factors. Sledging hunger is an entirely different thing from starvation. Its immediate effects are usually far more painful; and I speak from experience, having suffered from both on more than one occasion. The ration issued to sledging parties may be considered ample for all necessities. It is regular and its physiological effect is, I believe, as perfect as the effect of any known ration may be. It is well-balanced, having its due proportion of fats, sugars, other carbohydrates, and proteins. Yet, after the first few days, it leaves the man-hauling party with a craving which nothing can allay but the next meal and that but for all too short a time. The effect of this hunger upon the waking mind is to concentrate the thoughts upon every variety of savoury food that the individual has known. Its effect in sleep is to lead to a succession of food dreams which carry the dreamer from one paradise of the gourmand to another, until he awakes to find the craving for food almost unbearable. The normally constituted party talk food, think food, dream food. Jealous eyes watch every crumb of the ration which falls to the floor. The most unsavoury morsel, covered with filth, embedded in hairs from a debilitated sleeping-bag, is watched with the eager solicitude of a dog for a bone. No unusual titbit can be safely distributed without an informal ballot. The cook who "whacks" out the food is an object of suspicion to all ill-regulated minds.

While the craving for food is characteristic of all prolonged sledge journeys, especially those most gruelling journeys when sledges are propelled by man-haulage, the effects of the lack of sleep which is a feature of journeys carried out in the intense cold of spring and winter are, if anything, still more exasperating and are certainly more debilitating. With temperatures far below zero (the normal temperature of spring and autumn sledging ranges from — 20° F. to — 60° F., while extremes down to — 77° F. have been experienced) the degree of cold is in itself sufficient to ensure that, during the daytime, a man is never comfortable except when in harness assisting to drag his sledge. At night, he is toggled down in his bag with the reindeer flaps turned over and the possibility of undisturbed sleep rapidly disappears with the accumulation of the moisture from his breath and of the daily increment of perspiration drawn by the heat of his body from his clothes into his sleeping bag. A reindeer bag weighing 12 lbs. at the outset of a journey may reach a weight of 28 lbs. by the return, three weeks later. All the moisture has to be thawed out and brought somewhere near body temperature before sleep is possible. One has dozed off for a few minutes only—or so it appears—when the voice of one's leader announces that it is time to start the next day's trek. After a few weeks of such hardship a party of men in the prime of life will return haggard and worn, with faces lined like old men. The effect on the temperaments of the men concerned is such that the careful choice of parties for spring sledging is one of the most important duties of the leader of an expedition. Very few men would, I believe, have returned alive from that most terrible of all Antarctic winter sledging trips, the journey to Cape Crozier in Scott's last expedition. Many men might have been physically more capable than at least two of the members of the party. It would, however, have been difficult to find a team of three so temperamentally suited as to have withstood such an unparalleled strain. It is a fact that only the best-constituted parties can stand a prolonged spell either of Barrier or Plateau, or of spring or winter sledging without asperity and discord.

The third factor enumerated above—monotony of colour, of occupation, and of companionship—is particularly accentuated when, as in Barrier or Plateau travelling, nothing of outstanding interest is seen to attract the eye, or occurs to draw the attention, for many days together. Sledging along a new coast or up a new glacier provides so much fresh material of absorbing interest each day that monotony of companionship is to some extent relieved. Indeed, if things happen fast enough and there is enough incident, one's own character and that of one's companions reacts to some extent to the changing environment. Diversity in one's surroundings is thus reflected in an equally pleasing diversity in the temperaments of the party. If monotony does persist to such a degree as to have a noticeable effect it will make itself felt in a tendency to become taciturn; to be intolerant of otherwise harmless waggery; and to easy irritation and prolonged moodiness.

On a particular winter journey without sun, with a nagging wind and a low temperature, I can well remember conditions being such that, despite the fact that all the members of the party were close friends, conversation was practically tabooed all the forenoon. It was not until after the stimulating drink of tea in the middle of the day that any raillery became safe. Remarks during the morning were confined to a caustic and muttered commentary on the wind, the sledge runners, the surface temperature, anything, in fact, but one's companions. It was spring sledging which first taught me to swear; and I honestly believe that pungency of language as the only apparent safety valve for a temper frayed beyond ordinary words had a distinct use.

It is not only hardship, however, that may produce this extraordinary irritation. A long, apparently endless pull towards a miraged cliff has had a similar blighting effect on otherwise sunny characters. I remember one never-to-be-forgotten trek towards the Nordenskjöld Ice Tongue, the cliff of which was miraged up to appear about a mile and a half away. Hour after hour we pulled at a steady one and a half to two miles per hour and further and further away did the cliff appear to recede. Perspiration streamed off our faces, for we were over-exerting ourselves from sheer exasperation. Finally, the party was forced to camp without reaching its objective. As camp was pitched, the cliff and snowdrifts looked no more than a few hundred yards away; so near that one was tempted to go to it to gather ice for the cooker. We broke camp at six the following morning but did not reach the ice tongue until 4 p.m.

That second day's journey nearly dissolved the party altogether. Had it not been composed of men who for two years had been tried together under the harshest circumstances, the day could not have passed without serious trouble. It is a well-known truism of polar exploration that, apart altogether from mirage effects, miscalculation of distances is a definite danger to be carefully guarded against. The psychological effect of this on a sledge party is undoubted, for nothing is so fraying to the temper as the failure to arrive at an objective apparently within reasonable distance. Altogether different from these experiences, however, there is a marked tendency toward illusions in any sledge party that has been extended to the limit either of its physical or mental strength for some considerable time. Space permits of the citation of only two such cases here.

During the last Scott expedition a party was sitting in a tent eating a meal when one of its members exclaimed: "Why, there is the dog team coming out to meet us." One after another of his companions looked out and verified his statement. The team was quite clearly a long way off so they continued their meal, hastening as much as possible to be ready to greet the new arrivals. From time to time a glance outside showed the team still approaching at a rapid run, but strangely not appearing any larger. At last Captain Scott stepped out of the tent and at once, to his surprise, lost sight of the approaching team. His companions could not understand for they still saw it as plainly as ever. One after another tried the test and found the vision vanish as he left the tent. This caused close examination of the surroundings and the fact on which the illusion was based was found to be a little scrap of black film paper torn from a film pack and fluttering between two of the blocks of the skirting of the tent itself. It was one of the "grey" Barrier days without definite horizon, and the incident is quite typical of many similar occurrences to parties similarly strained by several weeks of hard sledging under severe conditions and with disappointing results.

My second example is one from my own personal experience. The Northern party of the same expedition, after a winter of terrible privation, was making its way along the coast in the direction of the main party's base at MacMurdo Sound. For months the thoughts of the whole party had been mainly concentrated on the possibility of relief; the fate of the *Terra Nova* and of the Southern party; and latterly especially, of the meeting which we hoped might take place any day. No one was met with during the two hundred miles or more of the coastal trek, but, on November ——, when crossing MacMurdo Sound, one of the sailors reported a sledge party approaching from the direction of Hut Point. Campbell and I walked rapidly towards the party when suddenly its leader drew aside and commenced to semaphore vigorously. We could neither of us make out anything more than disjointed letters, but at Campbell's request I endeavoured to establish communication. The signaller, however, appeared to be quite demented and we soon gave up our attempt and endeavoured to close with the party by walking. As we approached we grew more and more doubtful of their identity, and finally they proved to be emperor penguins. Our desire for relief, and, perhaps, some mirage, had converted a small body of four emperors into a perfect facsimile of a sledge party. It was not the first time this had happened, for a similar incident in mid-winter had led to most acute disappointment. None the less, this did not make the second occasion less exasperating; while it appears certain to me that had it not been for a predisposition to believe all objects other than veritable ice or snowblocks to be what we most wished to see, we should have suspected the true nature of the group much before we did. From this misconception of familiar objects it is not a far step to hallucinations which have no physical basis, and such hallucinations are a characteristic of the mental trouble of which one or more examples have occurred in many polar expeditions.

The effect of the gruelling nature of the work in a man-hauling party is seen mainly in one particular hallucination which must have affected pretty nearly all "man-sledgers" at one time or another. This is, the obsession that one is doing all the work oneself and that one's companions are "slacking on the trace." It is a somewhat ignoble confession, but I know I have had it myself and in the moments of confidence which come sometimes to friends I have discovered that it is sufficiently general to be called a rule. Nothing can be more disastrous for a party than for this suspicion to be based on fact, but this is seldom the case. The feeling is, however, nearly always existent and requires a real fight to be made against it. I have felt it about other people; I have no doubt others have had the same unreasoning suspicion about me. It occurs in spite of the reasoned appreciation each may possess of the other's sterling character, tested again and again in periods both of emergency and routine. A well-balanced mind can reason it away, but while hard sledging continues it will recur again and again.

My fourth heading, the fact that one cannot cast off one's companions of the journey, is peculiar in that it is the opposite of the factor of loneliness which one would expect to play so great a part in Antarctic work. In point of fact, loneliness and homesickness are two things which never affected me during either expedition. I believe that to be the general experience with the exception of isolated examples. Closer examination of the facts of a sledging expedition, especially of a party man-hauling over dangerous country, will bring to light very good reasons why one should wish for temporary loneliness at almost any cost.

Imagine a party of three men, friends though they be, roped together to a refractory sledge on a damnable surface all day; lying cheek by jowl in neighbouring sleeping bags or even in the same sleeping bag at night. In polar regions it is an almost nightly routine for each man of the party to require to urinate at least once in the night. If the country is very badly crevassed, each man must be let out on a rope or a companion must accompany him. If a geologist wishes to examine a specimen off the line of march, he must needs take two possibly unwilling sailors with him. If a navigator wishes to take a round of angles he must either rope himself to a sledge or keep back a chafing scientist to help him. If the cook wants snow he dare not dig without being tied to something or somebody. This is an extreme case, but the writer has sledged over snow-covered crevassed country where such precautions were not only desirable but necessary.

Finally, of the factors chosen for illustration, there remains the effect of the dangers of sledging. Two notable ones are the unexpected break-up of sea ice and crevasses. Here we pass over imperceptibly into the next phase of an expedition—the catastrophic phase. The particular dangers mentioned have, however, features of interest because they are encountered on sledging trips. The break-up of sea ice can be considered with comparative equanimity if one has by one any sort of apology for a boat. In many cases, however, no boat has been available. One may be cited as an ideal example of the sharp contrasts which make life peculiarly worth living in the Antarctic. For twenty-four hours three men were adrift on a floe. Two of them already not on too good terms; one labouring under the responsibility of having made a weak decision which had needlessly set the party adrift. Mutual recriminations might justly have been expected but this is just what did not happen. Even the playful attentions of killer whales attempting to break up the floe were treated with a somewhat dour complacency. It was a very unpleasant, an exceedingly unpleasant, twenty-four hours, but the generalisation that it is not the tragic, but the trivial, which causes the greatest soul wear and tear, held good. Actually when the floe touched shore after its twenty-four hours wandering, at least one member of the party was sound asleep. The impulse to spend the end of their lives rushing about like rabbits in a trap *had* appeared but had been promptly repressed. The repression was more than rewarded by the fortunate fact that the ice finally touched shore within 150 yards of the spot on which the tent was pitched.

As regards crevasses, there is little to say except that, while they give one a cold sensation down the spine at first, one soon gets absolutely used to them. Crevasse-tumbling is a harmless luxury while Alpine rope is good and plentiful. In its absence they are a danger unsurpassed in the Antarctic. With bad luck they may be dangerous in any case. Psychologically they have little effect except, perhaps, in inducing a certain nervousness which is curiously correlated with a continual and restrained attempt to walk as lightly as possible over dangerous areas. The writer has on occasion dreamt of falling down crevasses but such dreams have ousted the more common sensation of falling from a height, which is a normal experience of childhood days.

Perhaps the most interesting of all the reactions between the Antarctic environment and the temperament of the explorer occurs during the catastrophic period of expeditions. For the sake of clearness, this heading also needs subdivision as there are several possible types of catastrophe worthy of separate consideration. Thus we have:

(1) The detention or loss of the ship in pack ice.

(2) Catastrophes affecting individual sledge parties.

  (*a*) The starvation of an inland sledge party.

  (*b*) The marooning of a portion of an expedition with inadequate resources on an unknown coast.

(3) Polar madness generally.

The first case cited—the detention or loss of the ship in the pack—is unique in its psychological effects in that it involves the whole expedition. This is particularly so because, as all Antarctic explorers will admit, while much care is given and thought expended on the selection of members of a shore party, this is not always the case to the same degree with the crew. Nowadays, the normal *rôle* of the expedition ship is to transport the party to the south; establish them in winter quarters; perhaps land subsidiary parties, and then return. The Antarctic summer cruise is a relaxation after the more stormy work in the zone of the westerlies and no particular strain on the crew is entailed except in the rather infrequent blizzards.

A far different state of affairs exists, however, when the ship also is detained, often under peculiarly unfortunate circumstances. The monotony of existence while held up in the pack is very trying to the best constituted characters. It implies, in the Antarctic at least, the partial failure of the expedition. It searches out the weak points of those least suited to their unexpected environment. It is productive of indiscipline, irritability, physical and mental troubles of all kinds. In the least well-balanced physically, heart disease makes its appearance: in those least strong mentally, polar madness is a likely result.

Should the ship be crushed and the party be obliged to take to boats, or to improvised shelters, or snow or stone huts, all these facts are exaggerated and many casualties may be expected to occur.

A somewhat different aspect is met with in the second and third of the three catastrophes I have tabulated. The essential point common to both is that here we are dealing with picked men of the shore party. Essential differences do, however, also exist. In the one case we have a short sharp trial of strength with overwhelming natural forces which must prevail if the conflict is long enough drawn out. In the other case, we have a struggle for existence which may be prolonged almost indefinitely, growing more acute for some considerable time, but possibly, as the human frame and intelligence adjust themselves to new conditions, becoming somewhat ameliorated in the end. The difference is crystallised in the fact that the inland party is dependent entirely on the food it carries with it; while the coastal party has usually a good chance of living on the country in which it is marooned.

It is not necessary to deal at any length with the first case. The experience and the glorious death of Scott and his companions is well known from the publication of the former's diary in narrative form. The diaries of the other members of the party merely serve to fill out details without in any way contradicting the independent testimony of the leader. The story stands perhaps as the most rounded and outstanding example of the heights to which the human mind and character can rise in a party carefully selected and bound together by ties of affection and respect, and led by a leader of sterling character and lofty ideals. Emphasis need only be laid on the fact that there is no camouflage whatever about the story, for none was necessary. The private record of the members of the party are an unvarying tribute to the self-sacrifice of their companions. Until the end, mind triumphed over matter to an extent seldom attained in the everyday happenings of an imperfect world.

An equally interesting example of the third type of catastrophe came within the writer's personal experience in the marooning of the northern party of the same expedition at Terra Nova Bay. Here a party of six men, who had not passed the preceding summer in absolute harmony (though the rifts were very small and over trivial things), were faced with a winter quite unparalleled in the history of Antarctic exploration. The thing most worth emphasising as regards our life was the fact that the situation was taken in hand as soon as it was quite certain that we could not be relieved. A conscious decision was then made which contributed greatly towards the ultimate salvation of the party. Life for six months was to be lived in a land afflicted with a continuous blizzard; in a snow hut which could not be kept above freezing-point through lack of fuel; on less than half-rations of monotonous food; and with a minimum of light. Day after day would be spent lying in sleeping bags with nothing to do but brood over our prospects, or rather lack of prospects, unless we consciously endeavoured to lift our lives on to a higher mental plane. The prospect was disquieting, especially in the light of the slight lack of harmony which had already prevailed under easier conditions.

At the end of February, when all hope of being released was given up, a conference of the three officers concerned was held. At the conference four things of moment were resolved:

First, "destroyer" discipline, the hard-times discipline of the Navy, was to be maintained. This was essential, in view of the fact that half the party consisted of long-service naval seamen with their somewhat circumscribed and crystallised outlook upon life. Secondly, it was decided that, whatever happened, nothing should be allowed to cause differences of opinion to arise visibly between the three officers. The leader agreed to discuss frankly all vital, and—just as important—all apparently trivial questions: his subordinates to carry out his final decisions wholeheartedly. Thirdly, the food was placed definitely in the care of the man considered best suited for the purpose. Fourthly, the men were given half of the cave as their "mess deck" and, though it was impossible for the officers not to overhear, they were given free right and privilege to say anything they liked within these territorial limits. As the dimensions of the hut were 12 feet by 9 feet by 5½ feet, it can be imagined that this last was somewhat of an experiment, but, in the event, it worked perfectly. Discussion of naval officers was confined to past ships only, though possibly comparisons were intended to be drawn on some occasions. Of this fact I am certain, that the things they heard during the next few months must have considerably added to the fitness of both the naval officers concerned for the posts of command they were subsequently to hold.

Time will not permit of a full discussion of the reactions of temperament during the winter, nor for the recital of the means by which the mental tone of the party was kept throughout at quite a high standard. The all-important point is that never, from the time of the conscious resolve, did a cross word pass between any two members of the party either during the winter or afterwards. As an experiment, the policy of facing the facts was absolutely successful. Our experience proved definitely and finally to my mind that it is in the trivial things of life that the danger of the clash of temperaments arises. Once a courageous decision is taken and the facts looked full in the face, any great emergency can be overcome. The means taken to overcome it are likely at the same time to sweep aside the host of petty annoyances which might otherwise cause the utter self-destruction of such an isolated party.

One other aspect of the winter life, of interest, was the effect of environment upon the dream life of the party. The lessons of our conscious life were as recited above, but it is from our dream experiences that it seems possible to gather the dominant effects of environment upon the temperament and mind. The outstanding features of our dream life were dreams about food, relief, and disaster to our companions. So animal is man's nature that the first was undoubtedly the dominant theme. We were half-starved for months on end and once again our thoughts ran mainly upon food. There were, however, some interesting facts that were new to me. To begin with, for the first time, a new type of dream began to haunt us all. To take my own case, which was quite typical, I would dream that I was lying awake hungry, when suddenly would come the realisation that at the back of the hill in the lee of which our snowdrift home was situated, there was a confectioner's shop. I would get up, dress rapidly (cursing myself for a congenital idiot all the time for not remembering this before) and hurry out and round the bluff. The painful process of crawling in haste along the dark, narrow and low tunnel which formed the only medium of access to the open air was always particularly vivid. On arriving at the other side there was the shop sure enough, but, to my chagrin, it was early-closing day and after one o'clock in the afternoon. The shop was closed. The same dream appeared to one after another of the party; but in the case of the smokers it was varied by the substitution of tobacco and matches for food. In all cases, also, so far as my recollection goes, the day varied according to the particular early-closing day of the town from which the individual hailed.

The retailing of our dreams became one of our few relaxations, and hereby hangs a curious study of temperament. Two members of the party were much more lethargic in temperament than the other four. It is an interesting fact that whereas the remaining four of us dreamt continually that the board was laid for meals and then woke up, these two men again and again achieved the subconscious realisation of their desires. Whether it was an afternoon tea, a snack at a fried-fish counter, or a twelve-course City Company dinner, they went solidly through the menu and could describe it with gusto afterwards. This fact was in danger of becoming a grievance with the rest of us, for we had to take hold of ourselves and reason ourselves out of the idea that they were taking an unfair advantage of us. The " quid pro quo " we felt would be to reduce their rations accordingly.

Space will not permit of a close analysis of the other two types of dreams referred to. Their frequency of occurrence is not, however, surprising. Relief was not likely, but there were combinations of circumstances under which it was conceivable that a relief party might have reached us. It was very natural that we should cudgel our brains to think of any such possible situations. Indeed, on one occasion, the arrival of a party of emperors walking in file as a sledge party might do, led to very pleasurable anticipations. The dreams about disaster to other parts of the expedition were the most poignant of all. By a curious chance, at the time when we were waiting for relief there was no pack ice in sight, the belt which held up the ship on her three attempts being out of sight from the elevation from which we watched. Without disaster of some kind it was difficult to account for her absence. Our thoughts ranged from one disaster to another until, wisely, both discussion and thought on this subject were tacitly tabooed. One other curious feature was that—as far as my recollections go—no single one of us ever thought seriously of, or dreamt of, disaster to the polar party.

Finally, before closing the subject, short reference should be made to that very real danger to the polar expedition, the peculiar mental trouble which might perhaps best be called " polar " madness. It is a well-established fact that men mentally unsuited for polar exploration are liable to suffer from temporary mental aberration either during or immediately after an expedition. Cases have occurred in nearly all recent expeditions where real hardships have been incurred. The most extraordinary hallucinations afflict the patient and for the time being he is quite irresponsible. It is a merciful fact that this aberration is apparently temporary only, though in extreme cases it may last for months and even years. One factor worth mentioning is that it appears to be the most inelastic temperaments and minds that succumb. The higher strung and more sensitive the organisation, the better it will withstand extraordinary strain.

CRIMINAL RESPONSIBILITY AND INSANITY

By E. Prideaux, M.D.

THE question of criminal responsibility and insanity does not appear to have been seriously raised until the end of the eighteenth century, when public opinion, stimulated by the teaching of Pinel, was awakening to the demand for a revolution in the whole treatment of insanity. Before this time, quite irrespective of crime, those who were recognised as insane were compelled to endure all "the horrors of the harshest imprisonment; blows, bleeding and chains were their usual treatment"[1]; and horrible accounts have been given of madmen who had to spend the rest of their days bound down in the dark cells of the old madhouses. Earlier still many thousands of insane persons, unrecognised as such, were burnt as witches, and the stories of their trials are amongst the most humiliating memorials of our history. The condemnation of these wretches was eagerly sanctioned by the wisest men of the day, amongst others "by so learned and distinguished a judge as Sir Matthew Hale, and a not less learned and distinguished physician, Sir Thomas Browne, so late as the year 1662."[2] The particular reasons which Sir Matthew Hale gave for his judgment on the occasion of condemning to death the last two women who were executed for bewitching children in England have a general and lasting interest, for they seem to have been accepted as rational statements by the men of that time and are good examples of what we now call "rationalisation." "That there were such creatures as witches he made no doubt at all; for first the Scriptures had affirmed so much; secondly the wisdom of all nations had provided laws against such persons, which is an argument of their confidence of such crime." A third reason which had its weight in determining the verdict was the statement of Sir Thomas Browne,[3] who was clearly of opinion "that the persons were bewitched; that in Denmark there had lately been a great discovery of witches, who used the very same way of afflicting persons."

During the eighteenth century the criterion for responsibility was that laid down by Mr. Justice Tracey in 1724, to the effect that no person was exempt from punishment unless he was so deprived of intellect that he did not know what he was doing any more than "an infant, a brute, or a wild beast."

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[1] W. E. H. Lecky, *History of European Morals*, Vol. II., p. 38.

[2] H. Maudsley, *Natural Causes and Supernatural Seemings*, 3rd edn. (1897), p. 49.

[3] *Cf.* Sir Thomas Browne, *Religio Medici*: "For my part, I have ever believed, and do now know, that there are witches."

In 1800, just about the time that an agitation was being made as to the treatment of insanity, one Hadfield, who, as Mercier puts it, "was so unquestionably and deeply insane that his punishment would have revolted the consciences of men,"[1] was charged with high treason, in that he fired a loaded horse-pistol at George III. Possibly owing to the enlightment of public opinion, the "epoch-making speech of Erskine" in defence had so great an effect that Hadfield was acquitted, on the ground that he had not the faculty of knowing right from wrong, notwithstanding the fact, as Sir F. J. Stephen has shown, that Hadfield clearly knew the nature and quality of his act. He also knew that it was wrong, for the very object for which he did it was that he might be put to death in order that the world might be saved.

In 1843 attention was again called to the question of responsibility as the result of the acquittal of Daniel McNaughton on the grounds of insanity. McNaughton, who suffered from the form of insanity known as paranoia, had shot the private secretary of Sir Robert Peel, in mistake for the Prime Minister himself, in order to call attention to the system of persecution which in consequence of his delusion he thought was being directed against him. McNaughton's acquittal evoked considerable excitement and dissatisfaction and formed a subject for debate in the House of Lords. It was as a result of this debate that the fifteen judges were asked to formulate answers to certain abstract questions set them by the Lords relating to the law respecting alleged crimes committed by persons afflicted with insane delusions. These answers followed the ruling laid down in the Hadfield case, except that they were more explicit and limited the "knowing right from wrong" to the particular act committed. They have been given as the most authoritative exposition of the Common Law relating to exemption of responsibility on the grounds of insanity ever since.

Sir F. J. Stephen proposed that the law based on these answers actually is as follows: "No act is a crime if the person who does it is at the time when it is done prevented (either by defective mental power or) by any disease affecting the mind (*a*) from knowing the nature and quality of his act, or (*b*) from knowing that the act is wrong. But an act may be a crime although the mind of the person who does it is affected by disease, if such disease does not in fact produce upon his mind one or other of the effects above mentioned in reference to that act." Sir F. J. Stephen would also have liked to add to the above-mentioned effects another: "(*c*) prevented from controlling his own conduct, unless the absence of the power of control has been produced by his own default," although, as he admitted, this interpretation is a doubtful one; but such an interpretation does not appear to have been adopted, at any rate theoretically, by other judges.

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[1] C. Mercier, *Criminal Responsibility*, 1905, p. 186.

The law based on these doctrines is recognised by all legal and medical authorities as having serious defects, and in regard to it Dr. Nicholson writes: "The dictum is not a satisfactory one, and if it were insisted upon to the bitter end it would have been the means of hanging more than half the women and many men now in Broadmoor as criminal lunatics."[1] Moreover, Mercier has pointed out that the answers formulated by the judges are not answers in reply to the questions asked by the House of Lords. The questions asked dealt with "persons afflicted with insane delusion" and the answers given dealt with persons who "labour under such partial delusions only and are not in other respects insane." It must be remembered that at the time these answers were formulated a person was only considered insane if he suffered from a delusion. In those days delusion and insanity were almost synonymous terms. We now know that a delusion is only a symptom of a deep-seated disorder—insanity—and it is more correct to say that a person has a delusion because he is insane than to say that a person is insane because he has a delusion. So that, as Mercier says, "there is not and there never has been a person who labours under partial delusions only and is not in other respects insane."[2] These answers, therefore, if strictly interpreted, exclude from their scope all insane persons whatsoever, and admittedly are only meant to refer to a small class of insane persons, those suffering from delusions. This criticism is the gist of the whole matter. "This is the pith and marrow of the objection which medical men have from time to time taken to the law as expressed by the judges." It is upon the assumption that a person can be deluded without being in other respects insane that insanity is regarded by the judges simply as some particular deficiency of intellect and not a disorder of the entire mind. And if we take it, as in practice it has been taken, that the law applies to all cases of insanity, then it is necessary to understand the legal interpretation, if there is one, of the word "know." To establish a defence on the ground of insanity it must be proved "that at the time of committing the act the accused was suffering from such defect of reason from disease of the mind as not to *know* the nature and quality of the act he was doing, or if he did *know* it, that he did not *know* he was doing what was wrong." Now this criterion, as interpreted by medical men, is based on a radically wrong conception of insanity. It did not even apply to the Hadfield case, and if it were now used as a basis for the certification of insane persons our mental hospitals would be almost empty. Moreover, it does not allow for the fact that a person's judgment may be just so much at fault that, although that person may know that he is doing wrong, he does not know how wrong. "It is a truth," says Mercier, "on which I have insisted in season and out of season for many years, that a man may know that his act is wrong without knowing how wrong it is."[1] Sir F. J. Stephen instances the case of the idiot who cut off the head of a man whom he found asleep, remarking that it would be great fun to see him look for it when he woke; and adds, "Nothing is more probable than that the idiot would know that people in authority would not approve of this, that it was wrong in the sense in which it is wrong in a child not to learn its lesson, and he obviously knew that it was a mischievous trick."

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[1] Allbutt's *System of Medicine*, 2nd. edn. (1911), Vol. VIII., p. 1038.

[2] *Criminal Responsibility*, p. 176.

However, "as a practical guide," writes Sir Herbert Stephen in a recent controversy in the *Times*, "for judges and juries it has worked fairly satisfactorily ever since its adoption."[2] I would agree that as a practical guide it has worked fairly well, recognising either that it has been ignored when circumstances demanded, or that it has been interpreted differently in individual cases. It is the interpretation of it which is the difficulty. Some judges interpret it one way and some another, and some seem to ignore it altogether. This is well shown in the case of Rex *v.* James Jefferson, a case cited by Dr. Nicholson,[3] which I will quote at some length, as it illustrates so many of the points at issue, and as it is the only case of its kind which has been thus dealt with by the Court of Criminal Appeal:

> "Jefferson was tried at Leeds before Mr. Justice Bigham and three medical experts gave evidence as to his insanity. The *Times* (20th July, 1908) gives the following account of the concluding portions of the proceedings: In answer to the learned judge, they (the medical men) agreed that he knew he was killing the woman. But on the question whether he knew he was doing wrong their answers differed. Dr. Edgerley said he thought that the prisoner imagined that murdering the woman would be of some advantage to him by ridding him of a persecutor, and that this delusion would probably be so strong in his mind that all idea of right and wrong would be excluded. Dr. Exley said: 'I think he knew he was doing wrong, but I think he had no idea how wrong.' Mr. Justice Bigham directed the jury as follows on the question of insanity: 'If the prisoner knew that he was doing wrong, it does not matter that he knew how wrong. If he knew he was doing wrong, it does not matter that he suffered from delusions or hallucinations. A man commonly described as a lunatic may be as guilty of murder as any of you. You have to determine whether he knew he was doing wrong. It is for the prisoner to satisfy you by his evidence beyond all reasonable doubt.' A Juror: If there is any doubt he is not entitled to the benefit of it? Mr. Justice Bigham: No, it is the other way on; he must satisfy you beyond all reasonable doubt that he did not know he was doing wrong. The Juror: If he knew he was doing wrong but was insane, how then? Mr. Justice Bigham: If he knew he was doing wrong, it does not matter how

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[1] *Criminal Responsibility*, p. 191.

[2] The *Times*, Dec. 11th, 1920.

[3] Allbutt's *System of Medicine*, 2nd ed., Vol. VIII., 1911, p. 1039.

insane he was, he is guilty. The jury, after a retirement of one and a half hours, found the prisoner Guilty, and he was sentenced to death. The case came before the Court of Criminal Appeal, and the decision arrived at was as follows:

"(From the *Times*, July 31st, 1908). Mr. Justice Lawrance, in giving judgment, said that there was no doubt that the verdict given was unsatisfactory, and in his judgment it ought not to stand. He had read the evidence given by the doctors, and it appeared that there was strong evidence called before the jury which showed that this man was not in such a state of mind as to make him responsible for his act. The verdict given being unsatisfactory, he thought they ought to say that the verdict which the jury should have returned was that the man was insane when he committed the act. The verdict would be set aside, and the order would be that the prisoner should be detained as a criminal lunatic during his Majesty's pleasure."

This is a good example of the different ways in which the law may be interpreted, for the verdict was set aside apparently without reference to the question of "knowing," though it states in the Criminal Appeal Act, 1907, s. 5 (4) that the sentence may be quashed when it appears to the Court that the person is insane so as not to be *responsible according to law* for his actions.

So far it has been necessary for me to discuss the law as it is, or has been, or as it has appeared to me to be, but I must point out that I am not competent to deal with the legal side of the problem. As Sir Frederick Pollock says, when discussing the layman's difficulties in the study of law, "He has not only to discover for himself, often with much bewilderment, the actual contents of legal terms, but to realise the legal point of view and the legal habit of mind."[1] Now my experience of the law only consists in acting for a few years as a Commissioner in one of our Crown Colonies, where the law was codified and interpretation a simple matter, so that I have never got beyond the stage of bewilderment as regards the law, and I can only claim a medical point of view and a psychological habit of mind. I am going, therefore, to approach this problem from the psychological side, but in doing so I shall have to depart from the usual methods of treating it, so that I can only express my personal views based on experience of psychological principles. These views do not as yet represent any authoritative medical opinion, but they will do so to some extent at any rate in the near future.

Now the difficulty in, and very often the cause of, most controversies is that the two parties are talking in different languages, and such is almost always the case in the conflicts between law and medicine. The lawyers are for the most part discussing legal responsibility, and the medical men are discussing moral responsibility. But as far as medicine is concerned, there can be no argument about legal responsibility. Sir F. J. Stephen states that "judges when directing juries have to do exclusively with this question—Is this person responsible in the sense of being liable, by the law of England as it is, to be punished for the act which he has done ? " Legal responsibility is therefore a question for the judge and jury to decide; it takes no account of the ignorance of the law, and it admits of no controversy except on points of law. Mr. Justice Bigham's direction to the jury in the Jefferson case would appear to me, if I might be allowed to express an opinion on such a matter, to be as good an exposition of Sir F. J. Stephen's principle as it would be possible to find.

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[1] F. Pollock, *A First Book of Jurisprudence*, 1896, p. 5.

The only question at issue is that of moral responsibility and whether the law of England as it is can be justified. " The administration of criminal justice," says Sir F. J. Stephen, " is based upon morality. It is rendered possible by its general correspondence with the moral sentiments of the nation in which it exists, and if it habitually violated those sentiments in any considerable degree it would not be endured." I think it would be more true to say that the law is actually the witting expression of the moral sentiment of the nation. The moral sentiment which has its origin in instinct and works at first unwittingly gradually assumes the nature of awareness, becomes recognised by the nation, and is eventually established as law. So that law must necessarily always be a little way behind the moral sentiment. Now there appear to be two opposite tendencies which enter into the evolution, of the moral sentiment: (*a*) those connected with the altruistic tendency which are entirely of an emotional character; (*b*) those which are primarily connected with the egoistic tendency, and which with the development of intelligence give rise to the sense of justice. Justice, therefore, is based upon instinct and has its origin, as can be shown both historically and biologically, as a defence reaction corresponding to Dr. Rivers' " reaction by aggression to the danger instinct."[1] It consists first simply of an unwitting reprisal, and as it gradually evolves it leads to an unending state of conflict, which becomes harmful to society. With the further development of intelligence, society takes upon itself the solving of the conflict, making use of intelligence as a means to this end, and thus introduces the methods of arbitration and compensation. A further step is taken in the infliction of punishment by society upon the individual who has acted in opposition to its interests, a penal code is established, and later, by a process of rationalisation, society justifies the punishment on the grounds of determent and reform.

Hence an act which is wrong is one which is injurious to society and becomes a crime, and an act which is right is one which makes for society's well-being. But this only holds good within the society in which the moral sentiment is formed, so that what is wrong in one society may be right in another, and what is regarded as right at one period of history may be considered wrong at another. So that we have differences in law and moral codes in different countries, and this is the case in the laws relating to insanity and crime. As a contrast to the law in this country, for example, it is enacted in the revised Statutes of the State of New York that "no act done by a person in a state of insanity can be punished as an offence," and the French Penal Code says "there can be no crime nor offence if the accused was in a state of insanity at the time of the act." And whereas our present law allows that children under fourteen may not be legally responsible, and that no child under sixteen may be hanged, this is only an expression of the moral sentiment of the last century, for there is a case on record of a girl aged nine being hanged as late as 1833 for stealing twopennyworth of paint,[1] and there is the case cited by Dr. Kenny of a brother and sister, aged seven and eleven, being hanged at Lynn for felony in 1708.[2] And it might also be noticed that whereas during the reign of Henry VIII., lasting thirty-eight years, 72,000 criminals were executed,[3] capital sentences now are a little under thirty per annum and only about half of these are actually carried out.

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[1] W. H. R. Rivers, *Instinct and the Unconscious*, 1920, p. 54.

Crime, therefore, from its origin as an act of aggression against an individual has come now to mean an antisocial act—it is an expression of unrestrained egoism. And punishment from its origin as an unwitting reprisal is now assuming a reformatory aspect. But, however much we may revolt, as most of us do, against the terributive theory of punishment and claim with Bentham that terribution is only "a kind of collateral end," psychology shows that determent and reform are really secondary aims of punishment, and that deep down in the minds of all of us there is a feeling of satisfaction in revenge, which expresses itself in the popular saying that the punishment must fit the crime.

When, therefore, we say that a man is morally responsible we mean, when we have rejected rationalisation, that we feel the urge for taking revenge and are of the opinion that he ought to be punished, just as when we say that a man is a good fellow we mean that he affects us in a pleasurable way. Now this feeling is a varying attribute in each of us. It varies according to the constitution of the moral sentiment that is in us, and the moral sentiment is, as we have seen, a complex organisation of many tendencies. No longer can we scientifically recognise the old "moral sense" psychology with its conscience as a definite entity. What stands for the moral sentiment may be at the lowest stage of development nothing more than the fear of punishment —the old fear of hell and the devil—or the desire for taking revenge, but by a process of higher development and further integration with altruistic tendencies this eventually becomes what is known in psychology as the "moral character," that is, in the words of Professor McDougall, "the whole moral personality, a vastly complex system in which all the elements of personality work harmoniously together towards the supreme end of right conduct."[1] The moral character, then, should be the dominant factor in the hierarchy of the mind if society is to prosper, and it is this which enables us to exert what is usually spoken of as self-control and to act in accordance with the moral code. The feelings of justice which are aroused in each of us have therefore different values, and the attitude we take as to whether an offender is punishable or not probably depends for the most part on whether the egoistic or altruistic tendency is most liable to be stimulated. If the offender is a friend or a relative it is much more easy to regard him as insane and irresponsible than to hold that he is punishable. This is of course an extreme example, but modern psychology has taught us that we cannot escape altogether from such an attitude in other cases. As long as the question of responsibility depends on opinion for its solution, so long must there be a controversy in regard to it. One man may unwittingly develop his sense of justice at the expense of his altruism, and another may develop his altruism at the expense of his sense of justice. So that we find that not only is there a conflict between law and medicine as regards moral responsibility, but also that there is a considerable difference of opinion in each class amongst the lawyers and medical men themselves.

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[1] A. Wilson, *Education, Personality and Crime*, 1908, p. 212.

[2] C. S. Kenny, *Outlines of Criminal Law*, 9th edn. (1920), p. 50.

[3] W. A. Bonger, *Criminality and Economic Conditions*, 1916, p. 194.

Such being the case, there is at present no alternative solution to the conflict except that of compromise, and this is never a permanent way out for either party. But is there in the future any possibility of a satisfactory solution ? Can we hope to base an approbation on anything more substantial than opinion ? If not, then the controversy must remain, but we should at least clearly understand the elements on which it is really founded. The answer depends on whether we shall be able to find some standard by which we can measure moral responsibility, and that has not yet been found or even attempted on definite psychological lines. But I believe it can be done, and that it will be possible in the future to find such a standard, and that we shall be able to put forward a series of "responsibility tests" much in the same way that "educability tests" and "vocational tests" have been devised on a physiological and psychological basis. There must be grades of responsibility, but they cannot be standardised by degrees of intelligence, as the law assumes, although, of course, for responsibility or moral character to be present at all there must be a certain degree of intelligence. But the mere knowing of the difference between right and wrong is of little value in itself—a child may acquire this knowledge quite early in life, without necessarily having a sufficient strength of moral character to prompt him to right conduct. It is the feeling which prompts one to action in accordance with the moral code that is essential.

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[1] The *Hibbert Journal*, Vol. XIX, No. 2, Jan., 1921 : article by Prof. W. McDougall, "Is Conscience an Emotion."

As in the interval, until these tests are forthcoming, we must have some kind of standard to guide us, I presume that every person on reaching the age of sixteen[1] must be credited with a moral character of such a standard that he is able not merely to decide how far an act is right or wrong, but also to act rightly in accordance with the moral code and control his egoistic impulses. Such a presumption is necessary to escape the metaphysical problem of freewill, if we are to treat the problem scientifically and if there is such a thing as responsibility at all, and it is upon such a presumption that all our laws, education, and institutions of civilisation are founded. Freedom is possible at any rate in so far that in voluntary decision the whole self determines the choice, but at the same time this self that chooses is predetermined. As Bergson says, "What are we in fact? What is our character if not the condensation of the history that we have lived from our birth, nay, even before our birth, since we bring with us prenatal dispositions? Doubtless we think with only a small part of our past, but it is with our entire past, including the original bent of our soul, that we desire, will and act."

I am presuming, therefore, that the self which chooses has such a strength of moral character, in the lowest types perhaps consisting only of the fear of future consequences, that it is able to choose between right and wrong and to act accordingly. From this it follows that a man with such a standard must be held morally responsible for all actions which are the natural outcome of self-determination. This I consider to be the only practical criterion for moral responsibility that is applicable to crime. I would include under such actions impulsive acts, because the moral character must be presumed to have the power of controlling them, but not acts due to insane impulses. I would hold that in alcoholic and other forms of self-induced intoxication a man was responsible, in that he had allowed himself to get into that state, and for the same reason I would hold that a man in a hypnotic state was responsible, but that for acts carried out during sleep or under the influence of drugs which had been administered without his knowledge he would not be responsible.

The degree of responsibility for any act is, then, to be measured by the grade of moral character which is present at the time of committing the act. If the offender is of the age of sixteen he must be considered fully responsible for all his acts, unless it can be proved that his moral character does not come up to the required standard. Now the fact that a man is a criminal at all suggests that he has not reached a high plane in the development of moral character. We have now abandoned the positive doctrines of the Lombroso school, and we recognise, as both Maudlsey and Mercier always insisted, that we are all potential criminals and that crime is a function of two variable but complementary factors—constitution and opportunity. Whether a man becomes a criminal or not depends both on the strength of the temptation to which he is subjected and on the strength of his fortitude to withstand the temptation.[1] A man with a weak moral character will succumb to any temptation, whilst a man with a strong moral character may succumb to a temptation only of some particular strength or quality.

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[1] The law allows that no child under sixteen can be hanged—the correct age for full moral responsibility will have to be settled later by psychology. It is here taken as being quite arbitrary, but it is in accord with the Binet-Simon tests for general intelligence.

During the war we had an example of the same principle in the case of the war neuroses. The man with a poor mental constitution broke down during or sometimes even before training, and if he were strong enough to survive this and get out to France he broke down within a week or so, whereas the mentally stable man only collapsed as the result of some severe shock or prolonged strain, and sometimes not until after the armistice.

So it is with insanity, which is so closely connected with crime that it is often difficult to say where crime ends and insanity begins. Both are antisocial modes of adaption to a difficult environment. Crime may be simply unrestrained egoism, or it may occur as the result of a temporary conflict in which egoism gains the day, whereas insanity is the consequence of a prolonged struggle to restrain egoism, and only leads to an offence when the moral character has become so weakened as an effect of the conflict, or so disintegrated by actual disease, that restraint is no longer possible. Thus, as Maudsley puts it, writing in the days before Freud, "An immoral or actual criminal life might positively save a person from madness, and a duke's daughter become insane when a dustman's daughter remained a sane prostitute or thief."[2]

I must turn now to the two distinct classes of persons in whom the moral character does not come up to the required standard, and in whom some degree of exemption of responsibility must be allowed: (*a*) when the moral character has never been developed as in cases of what is technically known as Mental Deficiency, and (*b*) when the moral character has become disintegrated as the result of mental disorder.

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[1] *Cf.* C. Mercier, *Crime and Criminals*, 1918.

[2] H. Maudsley, *Pathology of Mind*, 1895, p. 82.

(*a*) Mental Deficiency is defined by Dr. Tredgold as "a state of restricted potentiality for, or arrest of, cerebral development," in consequence of which the person affected is incapable of maintaining existence independently of external support.[1]

Recently such cases have been recognised by the law, but it does not seem that the law is either generally known or sufficiently utilised by the authorities. Under the Mental Deficiency Act of 1913, a defective person found guilty of any criminal offence may be dealt with by being sent to an institution for defectives. Goring, as a result of his investigations amongst convicted criminals, states, "against the .45 per cent. of defectives in the general population, the proportion of mentally defective criminals cannot be less than 10 per cent. and is probably not greater than 20 per cent,"[2] and that with increasing degrees of recidivism there is a regression in the mean intelligence of convicts, so that with increasing frequency of conviction the proportion increases to 36 per cent., and this is the general opinion of all observers. Mental defect is associated the most intimately, according to Goring, with stack-firing, malicious damage to property, and with unnatural sexual offences.

Under this Act are included idiots, imbeciles, feeble-minded persons and moral imbeciles. The first two present no difficulty and are recognisable by the layman, but high-grade feeble-mindedness and moral imbecility do not present obvious signs of mental defect to a judge and jury, and require expert evidence for their demonstration. The case of moral imbecility is especially difficult. A moral imbecile, according to the Act, is "a person who from an early age displays some permanent mental defect coupled with strong vicious or criminal propensities on which punishment has had little or no deterrent effect." So that it is only after a person has been convicted several times that his condition may be recognised. Such are the cases who spend a few years going in and out of Borstal prisons and finally become certified. As they may show astounding ingenuity and cunning in the perpetration of their crimes, it is often difficult to convince oneself, and it is almost impossible to convince the law, that these persons are defective at all. Hence the law goes on attempting to brace their wills, as the lawyer puts it, by the fear of punishment, regardless of the fact that there is no will to brace, and that one cannot germinate a stone! An extreme example is the case quoted by Mercier of a man in Afghanistan, "who, after having had first his right hand and subsequently his left hand struck off as punishment for theft, seized with his stumps and made off with an earthenware pot of trifling value and of no use whatever to him, although he must have expected that he would be hanged, and hanged he accordingly was."[1]

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[1] A. F. Tredgold, *Mental Deficiency*, 2nd edn., 1914, p. 8

[2] C. Goring. Abridged edition of *The English Convict*, 1919, p. 179.

All mentally deficient persons, then, must be regarded as being not fully responsible, and they may now be so regarded legally by the Mental Deficiency Act, 1913.

(*b*) Mental Disorders. The problem is more difficult in the case of mental disorders. Dr. Kenny tells us that English law divides, and would seem to be fully justified in dividing, insane persons into two classes:—(*a*) Those lunatics over whom the threats and prohibition of the criminal law would exercise no control, and (*b*) those whose form of insanity is only such that—to use Lord Bramwell's apt test—"they would not have yielded to their insanity if a policeman had been at their elbow."[2] Dr. Kenny recognises the practical difficulty involved in the discrimination of these two classes, and when such discrimination is made on psychological lines, and is put to the test as a criterion for responsibility, it fails, as the majority of mentally defectives come under "the policeman" group. "A policeman at the elbow" removes one of our two complementary factors in the function of crime, the opportunity, and, moreover, many persons may be deeply insane and yet be able to take cognisance of a concrete policeman, when they are not able to think in the abstract and foresee future consequences.

Psychological medicine, however, cannot give the precise criterion which the law is entitled to demand to enable a jury to decide whether a person is insane or not. As yet, insanity is not capable of definition, and it cannot always be proved by a question of facts, but often only by inference from facts, and what a judge and jury would infer and what an expert in mental disease would infer from the same facts are often at variance. I sat in court recently listening to facts related by a doctor concerning the general intelligence of a boy who was alleged to be feeble-minded. From these facts I inferred not merely that the boy was feeble-minded, but that he was probably an imbecile, whereas it appeared that the bench of magistrates was actually inclined to doubt whether he was feeble-minded at all. Not only is this so, but it is often a matter of considerable difficulty for the expert to detect insanity in its early stages. When two medical men examine a patient at different times they may obtain different facts and come to opposite conclusions, whereas if they both had access to the same facts there would be a greater possibility of agreement.

The legal side of the problem is based on an antiquated conception of psychology and insanity, and it would seem desirable that any law which is based upon scientific knowledge should be revised with the progress of science if it is to escape being an archaic absurdity. An insane person is said to be of unsound mind, but mind is not synonymous with intelligence, as is so often assumed, and we cannot divide up the mind into faculties or speak of intellectual, conative and affective insanities as is done in books of law. It would appear that the intellect may remain to a great extent unaltered with disintegration of the moral character, but that deterioration of the intellect is always accompanied by degeneration of the moral character. So that it seems doubtful whether we can regard the degree of responsibility required for acts which are not antisocial, such as making a will, as being of the same degree as moral responsibility for crime, for the former may remain long after the latter has disappeared.

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[1] C. Mercier, *Criminal Responsibility*, 1905, p. 199.

[2] C. S. Kenny, *Outlines of Criminal Law*, p. 53, 9th edn., 1920.

Theoretically, then, both medicine and law are in a state of ignorance as to the criterion to be applied as a test for insanity, but whereas the law demands that there must be some hard-and-fast rule, medicine replies that theoretically no sharp line can be drawn between the sane and the insane. There are some who must be judged as sane and some who are undoubtedly insane—each case must be dealt with as an individual problem. No law would be applicable at present to all cases if justice is to be served. And this, now, is what appears to be happening in practice, and the law of 1843, although perhaps nominally adhered to, is being in reality often disregarded.

There is no practical difficulty with regard to persons who are deeply and unquestionably insane. They are dealt with on arraignment as unfit to plead, and most people are agreed that they are not responsible, though very few of them would satisfy the test of insanity laid down in 1843. And as regards moral responsibility, it would seem to be a correct interpretation of the existing moral sentiment of the nation to say that no person who was certifiable under the Lunacy Act, 1890, was fully responsible. It therefore seems an anomaly in law that persons who are certifiable under the Mental Deficiency Act, 1913, may be exempt from legal responsibility and can be dealt with in the police courts, whilst persons who are certifiable under the Lunacy Act of 1890 cannot be so dealt with by a magistrate in the police court on the grounds of insanity, but must go on to the higher court, and if not dealt with on arraignment are held to be legally responsible unless proved by the old dictum to the contrary.

I cannot deal now with the special cases which crop up from time to time, but I must briefly refer to those cases of insane or irresistible impulses which have been the subject of recent controversy. I stated previously that in my view persons could not be held morally responsible for acts carried out under the influence of such impulses. I am unable here to go into their pathology, but I suspect the cause of the controversy to be that medical men do not clearly distinguish between an irresistible impulse and one that is not resisted.

In the case of Rex *v.* Fred. Quarmby at Manchester on

February 25th, 1921, Mr. Justice Acton is reported as having directed the jury on the old dictum that "the only test was whether the prisoner was in such a defective state of mind that he could not appreciate the nature and quality of his act, but that irresistible impulse had never yet been accepted as an excuse for crime. . . . The evidence of uncontrollable impulse was based on speculative theories which had not yet been generally accepted."[1] Now although I would agree that in this particular case there was no evidence of irresistible impulse, and perhaps not even of an impulse that was not resisted, as the murder seemed to be a planned and deliberate act, exception must be taken to Mr. Justice Acton's direction if he means that such impulses, which we call obsessions, do not occur, or that the evidence for their existence is based on speculative theories which have not yet been generally accepted. It is, of course, quite open to anyone to reject any scientific theory—he may even reject that of the law of gravitation, for instance but when we are told that physicists find it satisfactory, and when we have learnt by experience that a slate falling off the roof may hit us on the head, we generally regard anyone who has their doubts about it rather suspiciously from the mental point of view. So when the true character of these impulses has been acknowledged by all mental specialists throughout the world for probably fifty years or more, when some of us are treating many of these cases every year, when so learned a judge as Sir J. F. Stephen would have liked to interpret the law as it is to include them, and when some countries, for example Queensland,[2] do actually include them in their laws, then medicine waxes wroth and says that the law is unreasonable when it rejects these theories in effect because it has no direct personal experience of them and cannot understand them. It is indeed remarkable that not more cases occur in connection with crime. Undoubtedly a good many cases of suicide are of this nature, but it is the rule in these obsessional cases that the patients are aware of their impulses, and so they put themselves under treatment and restraint to remove any possible opportunity for gratifying them. A satisfactory proof of an irresistible impulse as an exemption from responsibility would appear to be that the person was known to suffer from it before committing the crime incited by it, that he had himself taken steps to ensure himself against acting upon it, that the act was contrary to egoistic desires, and that it was not compatible with the then existing moral nature of the man as shown by the remainder of his conduct. If it can thus be proved that an irresistible impulse has incited a person to commit a crime, he should not be held to be morally responsible.

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[1] The *News of the World*, Feb. 27th, 1921.

[2] The Queensland Code of 1899 exempts a person from responsibility if he is deprived of "capacity to understand what he is doing or of capacity to control his actions."

In conclusion I will attempt to sum up what I have been trying to show. It would appear that, from the very nature of our being, a controversy over this question must always be inevitable, and that it cannot be resolved until we have some definite standard for moral responsibility. And experience of psychological principles justifies us in saying that moral responsibility cannot be decided by any test of intelligence, but that the moral essential factor is the presence of the moral character, in the absence of which we should all be actual criminals. And I have held that in all cases of mental deficiency and mental disorder there is some disintegration of the moral character, and that in such cases full responsibility would not appear to lie. I have pointed out that the law of 1843 is based on a faulty psychology, and that its strict interpretation must involve a miscarriage of justice, if justice is to be based on morality. But at the same time, medicine is not yet in a position to advise as to any precise criterion which might be formulated as law, and is of the opinion that the moral responsibility in each case must be decided practically as an individual problem. Moreover, it would appear desirable that just as law must coincide with the moral sentiment of the nation, so legal responsibility should coincide with moral responsibility.

If these opinions are acceptable, then it becomes a question for the law to decide whether it would be possible to take steps to enable each case to be decided on its own merits, and whether it would not be advisable to scrap an old law which is not in conformity with modern knowledge. It has been proposed by medical men that the question of insanity should not be allowed to be raised at all during the trial, if the offender is fit to plead, and that only after conviction should the defence of insanity be considered In such case they suggest that a further trial might be held as to the questioning of insanity and the jury might be helped to a decision by a report from a specified number of medical experts who had held a medical board amongst themselves as to the mental state of the prisoner, or that the question might be decided by the judge sitting with a certain number of medical assessors. Whatever method be adopted, if the person is found to be irresponsible, although we hold that punishment should fit the criminal and not the crime, society must needs be protected from such a person, and he would be sent to Broadmoor and detained during his Majesty's pleasure, for I would agree with the words of Anatole France: "The interests of justice are sacred, the interests of the offender are doubly sacred, but the interests of society are thrice sacred."

SCIENTISTS AND PSYCHICAL RESEARCH

BY E. J. DINGWALL, M.A.

IT is usually customary for scientific men to fight shy of the problems connected with psychical research. In the past a few found themselves forced to investigate for themselves, and their colleagues were delighted at the prospect of mediumistic humbug being exposed, only to be met with the sad admission of the investigators that they had found what they believed to be genuine phenomena and not the shameless fraud that their colleagues had expected. It is probable that in certain cases these scientific investigators were actually deceived, such as Alfred Russell Wallace, who appeared totally unable to distinguish genuine from fraudulent phenomena and who was almost undoubtedly taken in by certain slate-writing mediums. In other cases, however, and especially with regard to certain minor experiments, the excellent evidence in favour of the supernormal character of the occurrences was not even discussed, and critics contented themselves with abusing the investigators. Such an attitude on the part of scientific men was deplorable in the days of Daniel Home, but it is doubly deplorable now, when the mass of carefully sifted evidence for supernormal "psychic" occurrences can be scarcely any longer curtly dismissed as mere rubbish. How are we to account, therefore, for the scornful view that so many scientific men take of psychic phenomena ? I propose in this paper to try to answer the question and at the same time to indicate briefly the best avenues of approach through which psychical researchers may enlist the help, and possibly also the sympathy, of their co-workers in other branches of science. In doing this I shall say some hard things about "scientists" and also about "spiritualists," but it is as well to face the position squarely and not to pretend that agreement can exist where none is possible or even desirable.

Firstly, then, as to the scientific point of view. In discussing this we must understand exactly what we mean by the word *scientist*. By a scientist is usually understood a person trained in exact observation and one who, when considering the external world, has brought himself to apply certain well-defined canons through which evidence may be collected and sifted. In brief, a scientist is one who observes *facts*, classifies them, and finally forms some theory which apparently describes them. These theories, when they appear to cover all the facts observed, are sometimes called *laws*, although it is quite possible that some further facts may be observed later which tend to modify or even upset previous theories derived from an incomplete set of observed facts. There are, of course, scientists engaged in many different kinds of work. One may observe facts connected with the earth and its rocks: he is called a geologist. Another may study the formation of the human body and its relation to other animal forms: he is called an anatomist. A third may study the development of bacilli: he is called a bacteriologist. Now psychical research is very often criticised by biologists, anatomists, and zoologists, and there are many members of the public and some few psychic researchers who consider their opinions valuable. The opinion of a zoologist about psychical research is only important if his training in observing *zoological facts* has been used in observing *psychical facts*. Usually it happens that he has had practically no opportunities whatever for observing any psychical facts, but nevertheless, as a scientist, he gives his opinion about them. I could never understand myself why people do not ridicule instead of reverencing these foolish utterances. Supposing that I gave my opinion concerning certain problems connected with the structure of a chameleon's eyes or proceeded to write an article about pellagra, my utterances would be treated with disdain, and quite rightly so, for it would be obvious to any zoologist or medical man that I knew next to nothing about these matters. But let a zoologist or doctor of medicine write reams of rubbish about psychical research. The case then is very different. His opinions are treated with respect, and sceptics gravely produce the names of Sir A. this and Sir B. that as supporting their own foolish assertions. Spiritualists do the same thing when they bring forth arguments which support the opposite standpoint. They are very fond of turning their academic supporters into professors in the hope of making the names sound more weighty, and are also constantly confusing those persons who accept the evidence in favour of some kind of psychic *force* with those who think that this force is controlled or produced through the agency of spirits. Again, the physical or mental condition of the "scientist" does not matter to the spiritualist. He may be very shortsighted, or even half blind, but if his testimony is in favour of the reality of psychic phenomena then his name appears again and again with a wearying monotony. We cannot, however, dwell on these points but must return to our sceptical scientist.

In order to illustrate the extreme position adopted by the opponents of psychical theories I wish to draw my readers' attention to an amazing review in *Nature* (Nov. 18th, 1920), a paper which styles itself "A Weekly Illustrated Journal of Science." This article, headed "The Newer Spiritualism," and which is actually *unsigned*, consists of an attack upon Dr. Fournier D'Albe's admirable translation of Baron von Schrenck-Notzing's work on the *Phenomena of Materialisation*.

As this article well illustrates the hysteria which afflicts certain "scientific" writers when confronted with unpleasant facts, I propose examining it in some detail. The first plaint of the reviewer is that the details of the séances "are like one another as peas in a pod." This is most interesting, since usually if a single *unimportant* detail is omitted the accusation is that judgment is impossible since the facts are not published. Here, where details are plentiful (although in my opinion not full enough), our reviewer is grieved that so many are given, and evidently prefers, according to what, I suppose, is "The Newer Science" a mere record of phenomena without any of the accompanying conditions. This method of attack was employed recently against the Society for Psychical Research, in the *Proceedings* of which appeared some records of trance phenomena indicating that supernormal information was in some way being acquired by the medium's mind. In the course of the messages a good deal of apparent rubbish came through, such as an alleged spirit horse which a lady was learning to ride and the existence of spirit water, etc. In several quarters attacks were made on the Society in which the writers evidently preferred it to delete supposedly foolish portions of the communications, publishing only those which indicated supernormal agencies! Could a more unscientific method be imagined? The question has only to be asked to be answered immediately.

As will be remembered by those who have read Baron von Schrenck's volume, the phenomena which take place in the presence of Eva C. have been thought to be of what has been called an *ideoplastic* or *teleplastic* nature, words which the reviewer describes as "pseudo-scientific jargon." It is difficult to see in this statement anything but prejudiced animosity, and I pass on to a later statement which declares that "numerous photographs" of the medium "are sandwiched between faked spirit photographs.". Now to the person who has not read or seen the book this implies that portraits of the medium are scattered up and down the book, which also contains photographs of alleged spirits which have been fraudulently produced. Now, firstly, will the reader believe me when I tell him that the photographs of the medium are simply those in which phenomena are exhibited, where naturally the producer of the phenomena is included in the picture; and, secondly, that there is not a single spirit photograph in the book, if we take the meaning of "spirit photograph" to be that which is generally understood by that term? After this assertion we must not be surprised to find the reviewer saying that, "Apart from M. Richet, a somewhat credulous savant, no prominent man of science was present at the sittings, save one Dr. Specht, who, after three attendances, said that he had been 'shown materialisations which do not exist.'" Professor Richet is at once dismissed, as he has studied psychic phenomena somewhat closely and is therefore a person to be discounted. Dr. Specht is singled out because, although profoundly impressed by what he had seen, he confessed himself too ignorant of the possibilities of deception to bring himself to any other attitude of mind than one which was strongly negative. No mention is made of course of Dr. Bourbon, who was present at many more sittings than Dr. Specht and was apparently convinced that the phenomena were genuine. Similarly with Dr. Geley. The reviewer has, however, a suggestion which he thinks would put the matter beyond doubt. It is to form a committee to examine the phenomena, and of this body he proposes that Sir Ray Lankester, Sir Bryan Donkin, and Mr. Nevil Maskelyne should be members. This is indeed a bright idea, but why suggest Sir Ray Lankester and Sir Bryan Donkin ? Everyone knows why Mr. Maskelyne is proposed, but why ask a zoologist, and why, oh why, a Director of Convict Prisons ? This is not a question of a tapir's hind leg or the sanitary state of Princetown Prison. Why, then, request the attendance of experts on these subjects ? The reason is obvious. The reviewer, simple " scientific " soul, has remembered a certain incident which is supposed, although quite wrongly, to redound to the credit of these experts on pigs and penitentiaries. The story is briefly this: Dr. Henry Slade was a certain medium presenting slate-writing phenomena. Anyone who knows anything about psychic research is apt to think that scarcely a particle of evidence exists for genuine slate-writing phenomena. He takes the opportunity of sitting with such mediums in order to pick up useful hints on deceptive psychology. But not so our zoologist and prison commissioner. Sitting with Slade many years ago, one of them seized a slate upon which was naturally written the message prepared beforehand, and, wonderful to relate, they found it! Triumphantly they caused Slade to be prosecuted, and ever since have preserved a great reputation for the exposure of mediums. Another observer, Prof. Carvill Lewis, also sat with a slate-writing medium called Eglinton. Unlike the zoologist and the prison commissioner, he kept his head, and instead of hysterically seizing the slates he watched the *modus operandi*, and in a masterly report described exactly how the effects were produced and how the medium endeavoured to distract his attention. The two former investigators, however, are the ones selected by *Nature's* reviewer to investigate the phenomena of Eva C., and he proceeds to assert that the " so-called " evidence would be " judicially sifted " by them. What would he say to a proposal of mine that in order to examine the principles underlying radio-activity a committee be appointed of which an ornithologist and an inspector of slaughter-houses should be members, with the added proviso that these two members should have the reputation of bungling a previous experiment which they had been foolishly permitted to conduct ? Let us have an end of this rubbish and proceed to consider at somewhat greater length the real reasons underlying all this foolish venom and hysterical spite which disgrace the pages of a journal like *Nature.*

First, then, it is as well to remember that psychic phenomena at their present stage of development are of interest to but a few classes of scientific men. The physicist and the physiologist would find much material in the study of the physical phenomena, whilst the psychologist and the psychiatrist would profit by a careful survey of that wide field usually designated under the name of the mental phenomena. I have often discussed this question with physicists, and I think that I understand their point of view. Baldly stated, it is this: "These subjects are very interesting, but we have not the time to give to them. In the first place there is a great deal of fraud, and we have not been trained to detect deceptions of this kind. Nearly every medium has been found out at one time or another, and we cannot afford to waste our time and energy in investigating phenomena which may prove in the long run to be fraudulently produced. Even if genuine phenomena do exist, they are so hopelessly mixed up with deception that it is not worth while to disentangle them. The assertions also of the spiritualists annoy us. Every smear on a photographic plate is nowadays supposed to be the work of spirits, and when the developing solution has not been evenly applied the spirits have been weaving spirit garlands into the picture. Besides, the phenomena that we hear of are so silly and childish as to be almost revolting, and we can have nothing to do with them."

On turning to the comments of the psychologists we do not find that they are any more encouraging. Just now psycho-analysis is very popular in England and America. It is sometimes called the new psychology, not because it is really new, but because English-speaking psychologists have just discovered that some of the books on it have been translated into English. Like many valuable instruments of research, the psycho-analytic method was, and is still, violently assailed by people who do not understand it and whose own complexes are disturbed by its unpleasant truths. It is, however, being used as a sort of weapon against psychical research. Jung dealt with a case of what he styled "so-called occult phenomena" which has been translated in his *Collected Papers,* and recently a book has been published on spiritualism and the new psychology which professes to explain psychical occurrences by referring them to normal and abnormal unconscious psychological processes. I fear I cannot congratulate the new psychologists on their efforts, as they betray the fact that they know little, if anything, about psychic research in any of its phases. This brings us to the root difficulty in discussing psychic matters with scientific men. They know so little about it as to make their observations practically worthless, and in the case of those who have studied the material we find that they almost invariably accept the *facts* but differ in the *interpretation* of the facts. No opposition from so-called scientific men will ever alter facts. The facts may be unpleasant or may be destructive of existing theories, but *if* they are facts no ridicule nor attitudes of superiority can upset them. Thus, whatever "scientists" may say, it is a fact that so-called physical phenomena sometimes occur, and it is also a fact that information *not obtained through the ordinary channels of sense* sometimes comes through the agency of an entranced medium. The sceptic will immediately reply that this is an unwarranted assumption and the mediums employ tricks which even the skilled magician cannot discover. This is an old difficulty, and although I have dealt with it elsewhere a few words at this point may not be out of place. An interesting example comes to my mind in this connection. The other day I was talking to a thoroughly well-educated man who was engaged on scientific work. He told me that he had just visited a place of entertainment and had witnessed a version of what is commonly called the "Dictionary Trick," the effect of which is briefly as follows. The performer requests a member of the audience to thrust a paper-knife between the pages of a large dictionary, which can be examined at any time during the progress of the experiment. A word is then chosen on one of the pages through some such method as selecting numbers jumbled in a hat or a ballot-box, but before doing so a piece of folded paper with a prophecy as to the word to be chosen is handed to a member of the audience with the request to keep it safely until called upon to procure it. The word is then chosen, and upon unfolding the paper the same word is found written upon it. My friend was very much surprised at the apparent miracle and his explanation was most instructive. "Conjurers," he said, "can make you take any card in a pack, and therefore, I suppose, they can make you poke the knife into any page of the dictionary they like, and it was the same thing with the numbers." A similar explanation is constantly put forward by scientists to account for supernormal phenomena, and the argument is entirely fallacious. They assume what they want to prove. No magician in the world could have made that man thrust a paper-knife into any particular page of *that* dictionary. It was a matter of pure chance, although he saw no difference between forcing a card and forcing a page. I do not propose to explain the difference because I do not intend to explain how the experiment was accomplished, but I do say that until scientists begin to understand these things they will never be of much use in investigating psychic phenomena. Prejudice must be entirely absent if good results are to be obtained.

In the January number of *Science Progress* is an essay review of Baron von Schrenck's book before mentioned, by Dr. O. L. Brady. After the effort of *Nature's* reviewer it is pleasant reading, but I must take exception to two sentences concerning mediums. "The medium," he says, "sometimes practises fraud to satisfy the audience when genuine results are not forthcoming. This is an attitude difficult to cope with, and is not likely to appeal to the trained investigator." It is, of course, quite true that mediums do resort to fraud if the sitters are foolish enough to expect a long succession of genuine phenomena. This will always tend to occur until mediums are treated rationally and co-operate with the experimenters instead of being exhibited as freaks, with payment by results as the system of remuneration adopted. As to the attitude being difficult to cope with and not likely to appeal to the trained investigator, such statements are strange as coming from a scientific man. There are many branches of scientific inquiry which are difficult to cope with and which do not appeal to various kinds of trained investigators. That is, however, no reason why such inquiries should not be vigorously prosecuted. In psychical research there is much that is difficult to cope with, and much patience and forbearance have to be exercised. If the study does not appeal to scientific men, then it must be pursued by persons who, although not possessing perhaps a science degree, possess the scientific spirit. It does not matter in the least if a man has not passed examinations in Natural Science so long as he is capable of employing scientific method in the observation and classification of facts. Once the facts are obtained, men trained in various branches of scientific inquiry may be profitably consulted for elucidating details of too technical a character for any-one but the specialist. These experts should be called in just as the photographer is called in to photograph the phenomena, in order to give advice and assistance on specific points, and not in any way to act as judges as to the genuine character of the phenomena. The time is fast approaching when psychical researchers should give up the fruitless task of trying eternally to convince scientific men as to the actuality of psychic phenomena. The reality of psychic phenomena is as certain as any other phenomena in nature, and therefore offers a perfectly legitimate field of scientific inquiry. If these occurrences do not seem to fall into any of the well-known provinces within the confines of orthodox science, then a place ought to be assigned to them as soon as possible. Whether they ought to be included as subject-matter for physiologists or psychologists is a question which need not detain us here. It will suffice merely to point out the importance of including them somewhere. There is not the slightest doubt that eventually they will form an ordinary part of the research work undertaken in our great universities. Until that time arrives it is necessary for the work to be carried on by investigators supported by funds supplied by generous donors who have the sense to see the importance of psychical studies being continued. A properly-equipped laboratory for the prosecution of such studies is urgently needed in England to-day. It should be furnished with such apparatus as Grunewald has recently described and with many other appliances which need and ingenuity would doubtless invent. Such a laboratory could be built and equipped for what is, after all, a trifling sum, and it is a scandal such sufficient money cannot be obtained. As I have pointed out, scientific men will not support the project, principally because they labour under the extraordinary delusion that a medium is a sort of super-magician who can perform miracles. Coupled with this is a kind of superstitious fear lest the verification of these phenomena will lead to a wholesale revision of existing scientific theories and especially of that materialism popular among physiologists who have gained a certain reputation in their own line. Their pathetic welcome of psycho-analysis in the hope that it will save them from the supernormal is sufficient proof by itself that their conversion would be a difficult matter. Fortunately that conversion is not a necessity, and is only perhaps desirable on the ground that, once converted, they would cease from the mischievous activity of endeavouring to prevent any reasonable inquiry into the phenomena in question.

The spiritualists, on the other hand, are even more harmful than the sceptical scientists. As long as they persistently see spirits in every corner and hear spirit-raps in every creak, so long will the subject appear ridiculous to many otherwise quite reasonable people. A great many trance communications must unfortunately be unverifiable matter of doubtful sanity. As long as mediums are brought up in the unswerving belief in the spirit hypothesis. so long will research be hindered by the ritual and traditional observances of the devout séance room. Trance communications irritate and annoy the mass of commonsense people, who are neither capable nor sufficiently informed to be able to pick out those elements which appear to indicate the possibility of supernormal origin. Both spiritualists and scientists will eventually have to bow more or less to the decisions of persons who, from long training and experience, are able to draw broadly the dividing-line between the normal and the supernormal. Nothing, however, can be done without funds, and until these are forthcoming the subject should be left in the hands of persons who must endeavour to steer a straight course through a sea bestrewn with many rocks, and must be undisturbed by the antics of the spiritualists on the one hand and the scientists on the other.

THE HOMING INSTINCT IN DOGS

By Lieut.-Colonel E. H. Richardson.
Author of *British War Dogs*

THE subject of homing instinct is one which leads into many interesting fields of investigation, and is certainly of peculiar attraction to those whose perception is awakened to the fact of causation in mind. This sense of way-finding to a given spot is inherent in all animals more or less, starting at the top of the scale with man, but the real essence of this faculty is less developed in him than in the vast majority of the lower animals.

"God made man perfect but man has sought out many inventions." The word "but" in this sentence has much significance. Perhaps, after all, the many material props which man has produced from his own imagination, and which at first sight seem so highly desirable, have been all the time blinding him to ways and means of simpler and more far-reaching methods of attaining the same ends, but which must be sought in inspiration from a totally different source than his own human brain. When desiring to go to a given spot we consult maps, time-tables, signposts, etc.; in fact, our only way of getting there is by some assistance of this sort, and without these we should be completely at a loss.

My own actual experiences connected with this form of intelligence have been almost entirely with dogs, in whom this instinct is very highly developed. The intensity, however, differs in individual dogs, and also in various breeds. During the war several hundred dogs were trained as messengers and dispatch carriers. The training for this work was based on the homing instinct, but I found it necessary at the training school to study the psychology of each dog as the bent was much more highly developed in some dogs than in others. Dogs of wise and affectionate natures were the only ones of any use in the strenuous work they had to perform in the field, and the great lever by which the homing instinct was initiated, was that of devotion to the man who was deputed to be the dog's keeper. A dog could be taught the duties of messenger service mechanically, but when it came to maintaining this effort in the field only some very powerful emotion could enable it to overcome the obstacles in its way. In briefly describing these obstacles, I will explain that the messenger dogs for the British Army were concentrated in units behind the line and were dispatched in groups to those parts of the line where particularly strenuous fighting was expected. They went up in charge of their keepers, each man having three dogs. Arrived at Brigade headquarters, the keepers remained there and the dogs were taken from them by troops occupying the front line. The object of using the dogs was to have a channel of communication available apart from the telephone, which became useless after a bombardment, and also from the human dispatch carrier, to whom the risk was enormous, and who was also much hampered by the difficulties of the ground. The dog messengers, on the other hand, presented a smaller target to the enemy, and were able to negotiate the mud and shell-torn ground with comparative ease and consequently much faster than a man. But they had great difficulties to overcome, nevertheless, and without a powerful incentive, they would never have been able to carry out their duties whereby countless lives were saved. They were frequently taken up to their posts at night, over ground utterly unknown to them previously, and were released some hours afterwards with their messages. Sometimes they returned the way they had been taken up, but more often chose a more direct route straight across country, covering distances up to four miles, sometimes. It will be remembered that this would lead them over trackless ground, or along trenches and roads crowded with every sort of war traffic, through villages full of troops and every sort of obstruction and temptation.

That these dogs accomplished this work is one of the wonders of the war. *How* they did it cannot be fully explained, for the reason that we do not fully understand the influences which control the animals when under an overpowering desire to return to the place from whence they came. Suffice it to say that it was the determination to return to a beloved master, as represented by his keeper, and that as a result of this emotion, portents and signs indistinguishable to man were waymarks on the journey.

There are many instances of animals—of dogs and of cats—being taken by train, sometimes in closed receptacles, and, on being released, of finding their way back to their original starting-point. A very remarkable case is a trek by an Airedale, which is reported from British Columbia. The dog belongs to Mr. Fee, an architect of Vancouver, and he sent it by express over the Grand Trunk Pacific Railway to his brother-in-law, Mr. Paton, at Ardrossan, a station sixteen miles east of Edmonton, Alberta, in 1919. The dog arrived there but, before Mr. Paton could claim it, it managed to escape. In six weeks time "Buster" arrived at his old home emaciated, tired and footsore. The distance between the two points is 770 miles. For the greater part of the way there is no travelled road except the railroad track, which passes through three chains of mountains. Two-thirds of the distance is without habitation except the railroad section houses and, at long intervals, small stations, many of them without a single inhabitant. This feat of way-finding was very remarkable.

Human beings have risen to this mental sense of direction at times. One occasion came under my own notice. It was the case of a mother who was searching for the spot where her son had fallen on the battlefields of France. She was accompanied by two officers, one of whom had the ground charted out, and whose business it was to know the exact position of each landmark. She was able to give a fairly accurate description as a guide to the spot, which was marked on the map, but the vast upheaval of the ground made identification unexpectedly difficult until actually at the place. The officers searched in certain definite directions aided by their maps, but the mother, without knowing why, felt they were always in the wrong quarter, and instead of following them over the battlefield, she quietly waited till they returned from several fruitless attempts, and then they agreed to go with her in another direction to which she herself would have gone at the commencement. They at once found what they were seeking. She told me she " just knew " where the place was. Now here again you get the mental articulation of a tone from the soul brought out at the inspiration of love.

To revert to this particular faculty in dogs. I found that mere intelligence did not always prove a dog's capacity. There were many extremely clever dogs which quickly grasped the idea presented to them in their training and responded readily, for a time. As the tests became more difficult, however, although it was quite plain that the dog understood perfectly well what was required of him, selfish interests intervened—an interesting playmate in a village, a tasty bone by the wayside, etc. This type of dog lacked the great incentive at the back of the effort of intelligence and would never compass any great feats of endurance and enterprise. The spirit of selflessness is seen in a wonderful degree in other animals—in birds and in fish, etc. In their efforts to reach a given spot they are able to overcome countless obstacles and dangers. The motive power in animals less intelligent than the dog is usually supplied by the instinct of preservation of species. The love of their young involving the determination to seek warmer or more suitable breeding grounds, enables them to make extraordinary journeys across trackless spaces and through many waters.

Darkness and mist do not hinder dogs in their quest. In fact, a dog, once thoroughly trained, seems to work more surely and rapidly when all material help, visible to our eyes, is obliterated. In these circumstances, minute signs seem to become more apparent, and I have found the work done at night with dogs is uniformly more successful than in the daytime. Collies and sheep dogs are very clever, and I have found they are reliable because they are naturally very affectionate and faithful. Lurchers also are excellent, and they have the advantage also of speed. Certain of the larger terriers are very useful, such as Airedales and large-sized Irish terriers. I am frequently asked if poodles make good messengers, but I have not found them to be reliable. They have not been bred with any idea of honest work, and are too irresponsible, and also the fact of their scarcity and expense would put them out of court for training in any large numbers for public service. Fox-terriers and all the smaller terriers are too small to overcome the difficulties of transit such as rivers, ditches, etc., and also they too, lack the sense of work which in certain breeds have been bred into their natures through many generations. The larger breeds such as Danes, Newfoundlands, St. Bernards, are too heavy to go the distances often required, and it will be understood that any physical hindrances always contribute to a diminution of the natural instinct of home-finding. Sporting dogs are no use whatever as a whole, the reason being that for generations they have been trained away from themselves and have always been under the direction and domination of a human being, as represented by the keeper.

I think, as a whole, the lurcher, the sheep dog, working collie, an the Airedale may be given the palm for home-finding. These breeds have been used in connection with the intimate affairs of man for many generations, and have been trained to apply their intelligence independently of given instruction at any moment. In this way they supply their own initiative according to circumstances. The wisdom and deliberation in times of difficulty and temptation shown by individual dogs of these breeds is a very remarkable manifestation of the highest qualities of mind which man has considered to a great extent as appertaining entirely to himself.

In developing the instinct of home-finding it is necessary to place many obstructions in the dog's path, or rather to make his route lie where distractions and temptations may assail him in increasing proportions as the training develops. Thus, after he has shown that he can find his way across open country, and understands that the hedges, walls and streams must in no way interfere with his progress, but that he must by some method negotiate all these difficulties, he can then be sent through a village, where the temptation of the shops, the butchers' and the fish shops especially, the pleasures of a game with another dog, etc., etc., have to be met and overcome. All this has to be done gradually, and I have found the time necessary to develop the idea thoroughly in each dog's mind to vary very much according to the individual. Some dogs take longer but are more reliable in the end. Three months is a safe period, and I have found that; after that period, a dog that is going to be an efficient worker will generally be capable of taking a message four miles and pass through several villages *en route* without stopping. After that, steady daily routine running only tends to confirm the training, and care should then be taken not to over-fatigue the animal, and to change the training runs as frequently as possible to avoid staleness.

Reward is of course part of the training—and a very important part. Compulsion, coercion and punishment are anathema to all forms of training which is to remain on a permanent and satisfactory basis. I have never used a whip on a dog under course of instruction, and the only use of a weapon of chastisement, which generally takes the form of a good strong stick, is for the purpose of separating dogs fighting together. This behaviour on the part of the dog is a misdemeanour of the first importance, and the dog must be made to understand that it cannot be tolerated under any circumstances whatever.

The trainer's object is to develop an honest pride and love for the work in the dog's mind. The qualities of straightforward dealing and honest purpose have to be brought out, and one of the great interests in the task of training messenger dogs is that of watching these traits increase. The training is given daily and has to be steady and regular. The distances the dog is asked to cover are of course quite short at first, and increase in length from day to day. Tests must be given both by day and night and in fog and mist and rain. I could give many instances of particular runs, whereby the sagacity and pertinacity under countless difficulties are illustrated, but I have said enough to show that there is a wonderful source of interest to all students of psychology in this training of the homing instinct in the dog. That we do not understand it better is perhaps because so little attention has been given to it by those interested in the science of soul in the animal creation. When the creatures are studied from this point of view much may be explained which is now a mystery.

SLEEP

BY H. HARTRIDGE, M.D., AND W. WHATELY SMITH

THE study of dreams has played so large a part in the formation of modern psychological doctrines that it is surprising to find so little attention paid to the condition of Sleep as such. It is true that the dreams of deep sleep form but one extreme of a graded series of mental processes ranging through day-dreams and phantasies up to the fully conscious activities of waking life and that a similar gradation can be observed in the hypnoidal or quiescent conditions which accompany them. But the true dream is so closely correlated with the condition of full sleep that one would have expected psychologists to have attempted more seriously than they have done to show how the peculiar characteristics of mental activity during sleep (dreams) are determined by the physiological features of the state itself.

The object of this paper is to present, as concisely as possible, some account of these features and to state the rival views which have been advanced from different quarters to explain the phenomena observed.

The Physiological Phenomena of Sleep.—The more important physiological changes which accompany sleep may be summarised as follows:

(*a*) *Blood Pressure.* With the onset of sleep, the blood pressure drops; it then remains approximately constant until sleep actually begins, when there is a further and greater fall. During sleep there is a gradual recovery to a point slightly below the normal value, which is reached by a sharp rise at the moment of waking.

(*b*) *Temperature.* In a very similar fashion the temperature falls before sleep actually begins, and after this there is a further fall. It starts to rise again, as a rule, about 3 a.m., and regains the normal value at waking, if it has not already done so.

(*c*) *Respiration* becomes slower and deeper; in waking life inspiration and expiration take approximately the same time, but in sleep inspiration is much slower and expiration relatively quick. As might be expected from the greatly reduced expenditure of energy, the output of carbon dioxide is decreased. In daytime, respiration is mainly effected by means of movements of the diaphragm, but at night the costal muscles take a relatively greater share of the work; this is probably due to the fact that in the daytime the weight of the viscera is operative, whereas in the recumbent position of normal sleep it is not.

(*d*) *Reflexes*, such as the knee-jerk or the *tendo Achillis* reflex, are much depressed—that is to say, much less marked—both in sleep itself and during its onset.

(*e*) *Muscle tone*—i.e., the degree of permanent tension of muscles—is reduced and, similarly, reaction-time to stimuli is prolonged.

(*f*) The output of *Sweat* is approximately doubled.

(*g*) *Digestion.* The action of the digestive functions is accelerated to an extent of, probably, some 30 to 40 per cent.

(*h*) *The Special Senses.* The changes in these (Sight, Smell, Hearing, Taste and Touch) are distinctly the most important from the psychological point of view, and may with advantage be considered *seriatim.*

(i.) *Sight.* The pupils of the eyes are contracted and the eyeballs are commonly turned inwards and upwards, but this is not necessarily the case; the position adopted depends on the relative strengths of the muscles controlling the movements of the eyes, and any slight abnormality in these will result in a correspondingly different position of equilibrium when external stimuli are removed.

A sleeping person is *not* easily roused by a light stimulus thrown into the eye, and the threshold of sensation for sight is very distinctly raised; that is to say, a more intense stimulus is needed in order to produce a given sensational effect.

(ii.) *Smell.* Here, too, the threshold is raised, but not so markedly so as in the case of sight.

(iii.) The same is true of *Hearing* and *Taste*, but in a still smaller degree. The former recovers after about an hour's sleep to a point very close to its normal value, until just before waking, when it again rises slightly.

(iv.) In the case of *Touch*, the same thing occurs; there is a slight reduction of susceptibility to stimuli, but this is also of short duration.

It should be noticed that all the changes hitherto enumerated are in the same direction. That is to say, the general activity of the body is reduced; it becomes less receptive of stimuli from the external world and less ready to react to such as may be received. The psychological importance of this will be pointed out later.

Deprivation of sleep. The effects of deprivation of sleep are exceedingly severe and much more liable to lead to fatal results than abstinence from food for similar periods. Fasts of a month and more are not uncommon, whereas it seems that seven days and nights without sleep approximates to the limit of human endurance. Thus it is on record that three boys of average intelligence and vigour vowed they would not sleep for a week. On the fifth day the youngest suddenly fell asleep after gymnastic exercise; on the sixth the second fell asleep on horseback; on the seventh the eldest died. A servant girl nursing her mistress went into convulsions accompanied by amnesia and other symptoms on the seventh day. Perseus, king of Persia, deprived of sleep by his enemies, died on the seventh day, and a mechanic responsible for the maintenance of important plant in an emergency was taken seriously ill on the sixth sleepless day.

A patient deprived of sleep loses weight, and it is claimed that microscopic changes can be observed in certain brain-cells (nuclei do not stain; deformation and swelling; chromatolysis), but these are questioned by some authorities.

Theories as to the cause of sleep. Certain investigators have stated that sleep can be induced in normal animals by the injection of the cerebro-spinal fluid of other animals which have been deprived of sleep for long periods. From this it is argued that some kind of toxic substance is produced in the course of waking activity which is responsible for the physiological changes characteristic of sleep. This view is flatly contradicted by other experimenters who have failed to obtain these effects, but this is merely negative evidence, and on the whole this " toxic " theory seems the most satisfactory.

If this view is ultimately substantiated it will be readily correlated with similar doctrines which have been advanced to explain the phenomena of fatigue, and it would certainly be beneficial if those engaged on these two lines of investigation were to co-ordinate their results more closely than has hitherto been done.

It is also probable that the study of sleeping sickness and the effects of alcohol and other drugs may throw further light on the nature and mode of operation of the toxic products in question.

Perhaps the most formidable alternative view is to the effect that sleep is caused by a lowering of blood pressure, and it is noteworthy that an artificial lowering of pressure does induce a tendency to sleep. It is also quite fair to claim that a reduction in blood pressure must involve a smaller supply of oxygen all round and that this is calculated to produce just those effects which naturally characterise sleep. But the objection to this view, as also to that which regards the fall of temperature as the most important cause, is that, although the change in question is indubitably conducive to somnolence, it is not clear what process is responsible for originating it. Once the vicious circle is regarded as having been started, the argument is unimpeachable, but one wants to know what initiates the vicious circle, and it is difficult to answer this question without bringing in something of the nature of a fatigue-product of a toxic nature, which, of course, reintroduces the first theory.

In connection with the view that sleep is produced by a fall of temperature, it is interesting to note that a dormouse hibernates if placed in a freezing mixture and that Russian peasants behave in a very similar fashion at the onset of winter.

Another view is that sleep is of entirely nervous origin. It is well known that the connection between different cellular elements of the nervous system in the body is maintained through extensions of the cells (known as *dendritic processes*) which ramify from them and make contact, so to speak, with the adjacent cells. In normal waking life these dendritic processes are in functional relationship with the cells they serve, and it is suggested that in sleep they retract and thus increase the resistance offered to the passage of nervous impulses. This involves the supposition that there is some kind of a chemical or chemico-physical change at the dendritic junctions and of this there is no direct evidence, but the theory—if taken as ancillary to the main "toxic" theory mentioned above—seems plausible as a statement of *how* the toxic substances produce their effect or a part thereof.

At this point it is interesting to compare hypnotic with normal sleep. Dr. Rivers and others state that there is a very close resemblance between the two, and from this resemblance it has been argued that the origin of sleep is purely psychical. Such a conclusion appears weak, however. If we administer plain water to a hypnotised subject telling him that it is neat whisky, and he then shows every sign of intoxication, we will not, surely, maintain that every *physiological* effect of alcohol has been produced and that he is really intoxicated in a physiological sense. On the contrary, there is every reason to suppose that he is no more than playing a part—that of a drunkard—to the best of his ability, just as he might in the waking state if he possessed sufficient histrionic skill and the appropriate motive were supplied.

Similarly one suspects that the *vraisemblance* of hypnotic sleep is equally due to the acting of a suggested part.

It seems quite indefensible, in fact, to maintain that psychical changes are normally responsible for sleep : to do so is to put the cart before the horse. It seems unquestionable that what necessitates sleep is bodily fatigue due to prolonged activity, which demands a period of quiescence for the elimination of toxic products and the re-establishment of equilibrium in the body. It is not impossible that there is also a necessity for some kind of a psychical replenishment or "re-charging," as certain exponents of the transmissive theory of consciousness have maintained, or it may be that whereas most of the ravages of activity may be repaired in waking life by the ingestion of food and the consequent acquisition of physical energy, there are others—those in the brain to wit—which demand complete quiescence before they can be effected. But in any event, the psychical theory of the origin of sleep seems open to criticism as a *hysteron proteron.*

Blood supply to the brain during sleep. The evidence on this point is, perhaps, somewhat inconclusive. On the one hand it is stated that in infants the spaces between the sutures of the skull show that there is a diminished supply of blood during sleep; on the other that the pulsations of the brain are more obvious in sleep, from which it is argued that the blood supply must be more copious. But this is a *non sequitur*, and other experiments depending on a determination of the relative *weights* of the brain in sleeping and waking life seem to indicate that the supply is diminished. But, in any event, it is unlikely that, in normal sleep at any rate, the question of blood supply is of more than secondary importance. The view that sleep is due to this cause is also clearly open to the same criticisms as were brought against the " blood pressure " and " temperature " theories mentioned above.

Insomnia. The usual treatment for insomnia at the present time consists in the administration of a sleeping draught. This is merely stupid, since, in defiance of all sound medical principles, it aims merely at the elimination of symptoms and not at the removal of their causes.

One of the present writers has had much experience of insomnia in his own person, and has also enjoyed considerable success in treating it in his patients. He finds that most persons who complain of sleeplessness admit that, at one time or another during the evening, they "feel sleepy," but add that "the feeling passes off." He has found it advisable to urge them to go to bed whenever they feel sleepy—no matter at what hour—and he further believes that the common practice among such cases of taking a very light supper is quite wrong. A good solid meal is one of the best predisposing factors for sleep, and a short walk after it, continued until a feeling of somnolence sets in, is usually beneficial.

He has also noticed that *dryness of the cornea* is another very potent predisposing cause, and is of the opinion that if this can be induced sleep is very likely to follow. He has found that the application of a suitable preparation of menthol (Unguentum methyl salycilatis, CO fortis) to the face and nose is very efficacious in this connection.

This procedure is so simple that most patients require additional suggestive treatment in the form of a " placebo." For this purpose a judicious mixture of ginger, mustard and peppermint is valuable. It is a good carminative, and probably assists matters by causing vaso-dilatation of the stomach and thereby lowering the blood pressure in the brain.

The psychological significance of sleep. It has already been pointed out that the condition of sleep is of very great relevance to the phenomena of dreams, which have played so large a part in the development of modern psychological thought, and this article may well be concluded by a short discussion of this aspect of our subject.

A considerable advance of a certain kind was registered when it was realised that dream processes closely resemble those of infantile and primitive life. But, interesting as this conclusion is, it is not in itself an advance in explanation. It is necessary to ask ourselves *why* the conditions of sleep produce psychical results similar to those obtaining in infants or savages, and we ought not to be satisfied with our account of dream processes until we are in a position to answer this question in terms of those characteristic features of the condition of sleep itself which distinguish it from waking life.

To do this is, we believe, much less difficult than might at first sight appear.

Many modern psychologists, following Freud, distinguish two opposing groups of mental tendencies, which are referred to as the Pleasure and Reality principles respectively. Of these, the former represents the crude, innate, instinctive cravings such as Hunger, Self-preservation, Sexuality and the like, while the latter is based on acquired experience, and comprises systems of ideas of a social, ethical, or cultural nature whose potency arises from the necessity of an individual organism adapting itself to the conditions of communal life.

It is by the conflict between these two kinds of tendency that the course of mental processes is determined. The fundamental instinctive tendencies are primarily asocial, but by contact with the social environment derivations of them are produced which conflict with their direct and crude satisfaction.

The problem is to decide why, in normal waking life, the systems of ideas corresponding to the reality principle should prove more powerful than those corresponding to the pleasure principle; why the former should be less easy of displacement than the latter, and why this should be reversed during sleep.

It seems probable that the answer is to the effect that the " reality systems " are kept more or less in the foreground of consciousness, so to speak, by the associations perpetually aroused by the incessant stream of sensory stimuli which bombards us throughout our waking life. We are constantly held up, as it were, against the hard world of reality by the sensations which for ever pour in upon us. Commonplace objects, tables and chairs, trees and houses, our fellow men and women, are constantly presented to us and keep in the foreground of our minds countless systems of associated ideas corresponding to our experience of their properties and behaviour. It is with these that the " pleasure systems " conflict; it is these which differentiate Dream and Phantasy from Reality.

We can, to be sure, conjure up the most delectable images at any time, but we know them to be imaginary and not real because we cannot touch them or otherwise deal with them as we can with the objects which actually surround us.

But if we close our eyes and our senses become less acute with the onset of sleep in the manner described above; if the stream of sensory stimuli is wholly or even largely cut off, then there is nothing to hold us up against reality, and we can no longer recognise phantasy as such.

Consequently, the aforesaid cultural, ethical or practical systems are no longer kept in the foreground, and the instinctive tendencies of the mind have proportionately freer play.

This seems likely to be not merely the chief but absolutely the *only* essential difference between the waking and sleeping states on the psychical side.

We are thus in a position to understand precisely *why* dream processes resemble those of infants and savages. The latter possess relatively little of the experience on which the Reality Principle of civilised adults is based, whereas they possess innate primitive cravings in full measure. And in dreams the experience responsible for the Reality Principle and for the cultural and ethical systems which lead to the repression of "complexes" based on primitive tendencies is deprived of its normal weight because it is no longer kept in the foreground by sensory stimuli.

The balance is, in fact, in favour of the instinctive cravings, because the *somatic* sensations which keep *them* active appear to be much less deadened in sleep than are the extero-receptive sense organs concerned with the picking up of stimuli from the outside world.

On these lines it seems possible to account for the irrationality of dreams and their divergence from the ethical standards of waking life without being compelled to ascribe any magical properties to the sleeping state as such. If the view outlined above be correct the differences between the results of mental activity in dream, infancy, savagery and adult waking life respectively are due not to different kinds of processes or laws being involved, but to the latter having different materials, so to speak, to work on. And this difference in material is directly explicable as a necessary consequence of the obvious characteristics of the sleeping, infantile or primitive conditions. This seems to constitute a more real unification of the processes concerned than does the mere statement of the resemblance of these states.

THE NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY

We have much pleasure in printing the following notes on the work and aims of the National Institute of Industrial Psychology. There can be no question but that Psychology is destined to play a great part in the future development of industrial methods, in the increase of efficiency, and in the solution of many difficulties which are at present impeding the utilisation of human resources to the best advantage.

Elaborate methods are commonly employed for the selection and grading of raw material so as to ensure the allocation of its different varieties to the uses for which they are best fitted. But comparatively little has hitherto been done with regard to the equally important and variable human element.

The National Institute of Industrial Psychology, initiated by Dr. C. S. Myers, the present Director of the Psychological Laboratory at Cambridge, to whom we are indebted for these notes, has already done invaluable pioneer work in this field and is certain to prove of the utmost value in the future.

We hope to be able to publish reports of progress and research work accomplished in subsequent issues.—[*Ed.* PSYCHE.]

BY DR. G. H. MILES.

THE most urgent problems which face industry and commerce at the present day concern the human rather than the material side. The material problems already receive the careful attention of expert physicists and chemists who have at their disposal not only well-equipped laboratories and highly-trained staffs, but also the results of years of carefully-established facts to guide them. In striking contrast, human problems are still decided by rule-of-thumb methods, and there is an alarming dearth of accurate information on which to base methods for the best application and conservation of the nation's greatest asset—its human life and energy.

There is here a great field for careful research and investigation, but at present industry has neither time nor scientific resources available for dealing with these problems.

To meet what is now an urgent need, the National Institute of Industrial Psychology has been established. It will, on the one hand, make known to physiologists and psychologists what problems are calling for attention and, on the other, will assist in the practical application of the results of research.

In order to carry out the Institute's schemes satisfactorily there is need for very careful co-ordination of purely scientific research work throughout the country, and at a recent meeting of the Scientific Committee arrangements were made for this to be done. But although this is essential to progress, it is equally necessary to discover the best methods of the application of the laboratory results, and for this purpose specially trained men are necessary; for although the Universities provide courses in pure science, further training in its application to industrial conditions is required. The Institute has therefore taken in hand the preparation of suitable training courses.

Industry is giving its help, and, in spite of the critical times through which we are passing, many of the more progressive firms are providing liberal support. The Carnegie United Kingdom Trust, the funds of which are applied to the improvement of the well-being of the masses, has also given a generous donation for a period of five years. All funds are to be devoted to the extension of work, and if only a start can be made on a sufficiently broad basis it is hoped at the end of five years the Institute will be self-supporting. Many requests have already been received from firms who wish to have their special problems investigated and who are prepared to pay substantial fees for the work, since they realise its value and necessity under modern conditions.

A number of Trades Unions and Labour Organisations have also been approached, and in every case a very satisfactory response has been obtained, the leaders being evidently convinced of the necessity of the application of science to the human side of industry.

The Immediate Work of the Institute

(*a*) The Institute's Scientific Committee, consisting of those heads of laboratories and scientific departments in Universities, Technical Colleges, etc., who are specially interested in industrial physiology and psychology, has provided for co-ordination of research work in these branches. It is arranging for a supply of investigators properly trained in the general principles of physiology and psychology, and it will also serve as a *liaison* between those engaged in scientific research and its industrial and commercial application.

(*b*) Organisation of training courses. These are being at once organised for welfare workers, etc., and for investigators who have already received the proper scientific training.

(*c*) Throughout the country the Research Associations formed for the purpose of dealing with the material side of industry are finding that the success of their work will be largely dependent on a thorough understanding of the psychological factors involved. The Institute has already been approached by the Cotton, Wool, Glass and Launderers' Research Association in connection with the psychological problems encountered by them. To the workers in these and other industries the Institute can be of the greatest use by co-operating with such associations and advising as to the best methods of dealing with the human problems which confront them.

It is, however, imperative that many more investigators should be trained, but the initial expenses connected with this are heavy. The Institute is also repeatedly receiving requests for vocational guidance,[1] and although good work has been done in this direction there is need for much more research. This, again, is unremunerative until it can be applied, and the Institute is appealing for funds to cover a period of five years in order that this preliminary research work may be done thoroughly and well. The demand for work of the type which the Institute is undertaking is so great that there is already a danger that it may be attempted by unqualified persons to the discredit of science and the detriment of the worker. The Institute has on its Scientific Committee those who are foremost in their respective branches of science, and the constitution of its Council and Executive is a guarantee that its work and aims will be in the best interests of those engaged in industry and commerce.

The address of the Institute is 329, High Holborn, London, W.C.

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[1] "Vocational guidance" consists in advising workers as to the occupations for which their innate capacities best fit them. It can only be achieved as a result of thorough experimentation in the specific capacities required for different occupations and the best ways of detecting them in individuals.—[Ed., *Psyche.*]

FIRST STEPS IN PSYCHOLOGY

By I. A. Richards and C. K. Ogden

A FEW years ago the word Psychology was a technicality covering a field of inquiry in which none but specialists and perhaps a few enterprising teachers were expected to take an interest. To-day it would be hard to find a general reader of current literature who had not at any rate browsed through one or more of the books on psychological topics which appear every other day.

There are, however, among these readers many who feel a difficulty in comparing and combining together the views, opinions, and information thus casually obtained. Although interested, they have no time for the study of voluminous works on first principles. They would like to read the *Principles of Psychology* of William James, the *Analytic Psychology* of Professor Stout (having dipped perhaps into a volume with almost the same title by Dr. Jung), Urban's exhaustive investigation of *Valuation*, Professor Ward's *Psychological Principles*, or Baldwin's *Thought and Things*. But even for those who have the time to make such an experiment, it is not readily discoverable which is filled with mysticism and which with meat.

It was therefore suggested that readers who are seriously approaching the subject for the first time, and who look to *Psyche* to help them in forming an estimate of current tendencies, would welcome a brief account of the nucleus of accredited opinion from which the growing science of Psychology is tending to develop. In what follows, therefore, will be found an endeavour to deal in the simplest possible language with elementary subjects as discussed in standard works, and to deal with it more concisely than has been done by any introduction hitherto. This conciseness must be an excuse for any lack of precision. No attempt at originality has been made, nor are the views here represented in all cases those which, given the opportunity of a full technical statement, the authors would regard as most satisfactory. The refinements and adjustments which any science demands for its adequate formulation cannot in all cases be simply stated until some of its special terms have become current.

A sudden interest in any science is due either to new methods (as in the case of modern mathematics), or to new subject matter, as in the case of Radio-activity. In the case of Psychology, both these causes have been present. New methods—the laboratory and the new hypotheses of the Unconscious, and the Mneme. New subject matter —Hypnosis, Psychical Research, "Neurasthenia."

As a result Psychology, the study of the Psyche, now sets about its business just as any other study, collecting its information from any source which gives relevant results; partly by introspection and partly by deliberately selecting and interpreting various signs as corroborative evidence. There are, it should be noticed, no other facts which can be *directly* studied quite in the same way as our own "experiences," our own feelings; upon these, and upon the study of Behaviour, psychology is based. Behaviour, which is particularly of value in providing corroboration, is studied like any other subject matter. This possibility of direct study (introspection) gives to psychology a privileged position, and adds to its fascination as the most fundamental and intimate method of studying any portion of reality. The fundamental nature of psychology is also shewn by the fact that all our knowledge starts from sensations, the investigation of which is an important branch of psychology. Starting from sensations we proceed by processes of interpretation to infer the nature of the universe, the laws of these inferences being known as physics, physiology, chemistry, and the other sciences.

A certain amount of training is, however, necessary in introspection as in all other pursuits, and from a practical point of view psychology is largely an acquirement of this training. The subject matter on which it is exercised is perhaps best indicated by an example.

As the reader reads these words he will probably agree that many things happen "in his mind."

He *attends* to the marks on the paper, he *thinks* and *understands*, he takes up an *attitude*, he *remembers*, he is *interested* or *bored* as a consequence, his *instinct* of curiosity is perhaps aroused, or possibly he is *irritated* by the obscurity of the style. He *endeavours* to persevere, until eventually he feels *tired*, and to avoid *pain* he falls *asleep*. But even then he may *dream*, and on awakening may *forget* his dream—though if *hypnotised* he may rescue it from the *unconscious*.

All these are psychological events described in current psychological language, and in psychology we are either engaged in classifying such events and elaborating our descriptions of what takes place, or in seeking for their causes, *i.e.*, explaining why just that particular process took place at just that time in just that way.

The first of these, classification, is academic psychology—useful when wanted, but receding in favour of genetic and causal treatment. By genetic treatment is meant the treatment which seeks for light upon the things with which it deals through the study of their history and development. When we thus approach the mind we find that the importance of past history is far greater than it is with physical processes. A tea-cup, for instance, is little affected in its behaviour by what has happened to it in the past, but nothing that a mind does, or that can be done by a mind, is unaffected by its previous experience. It is, in fact, the first principle of psychology to recognise the peculiar way in which experience leaves effects behind it. Whenever we think of anything as being this or that, there are, as Professor Stout puts it, "processes of interpreting, identifying, classifying, recognising, etc., by which the object is brought into relation with the results of previous experience as retained and organised in preformed dispositions." Similarly anything we do by habit we do only thanks to our past experience. Instincts may be regarded as habits pre-natally formed. Thus we never think or feel or act quite freshly and spontaneously, for the character of our thinking, our feeling, and our acting is always due, in part at least, to the ways in which we have thought and felt and acted in the past. What exactly this dependence in any particular case may be is the main question which psychology attempts to answer, and it is chiefly in order to trace these connexions more easily that it adopts certain technical distinctions.

Popular language in all matters that are connected with the mind is apt to be vague and misleading. Psychologists have, therefore, felt obliged to introduce terms freer from irrelevant associations than those in ordinary use, and these often make the subject seem dry and abstract to the beginner. But if it is realised that they are only names for what must from the nature of the case be processes familiar to everyone as part of ordinary experience, a little patience is all that is necessary for the mastery of current opinions.

Thus we find *Psychosis* ("state of mind," and sometimes "abnormal state of mind"; much as *phenomenon* = "appearance" and sometimes "abnormal appearance"), *Conation* (striving), *Volition* (will), *Affect* (feeling), *Cognition* (knowing process), *Engram* (disposition), *Presentation* (sensation), *Ideation* (thinking), *Hedonic tone* (pleasure), *Endo-somatic* (inside the skin).

Described in the most general terms, the business of the mind is to adapt the organism to its environment. The process of continual change from adaptation to adaptation is what is known as *Conation*. In cases where there is conscious effort this process is popularly known as "willing." It is, however, now widely held that there is no essential difference between automatic responses to the environment and those responses which, owing to a conflict of tendencies, seem to involve the efforts of something which may be called "the Will." There are difficulties in admitting such an agent as the Will into psychology as a science, since if there were such a thing, it appears that nothing could be known about it. On the view that all mental change is conative, we must of course admit that we are "willing" even when we are asleep, and much of the work of modern psychologists, such as Freud, is devoted to shewing that we constantly have volitional processes of which we are unconscious. The "libido," which now appears so prominently in psycho-analytic writings, is a name for this general striving activity, which is regarded as hardly if ever suspended.

The exact forms which this striving takes on any occasion, those features which make an act or adaptation applicable to one thing rather than to another, are *Thinking*. There are not two kinds of activities which we perform: (1) Thinking, (2) Willing. They are inseparable aspects of a single process. The thinking is a form of the willing, much as the contour of a mountain is not something independent of its stuff, but simply the stuff in a certain shape—the shape of course depending on the nature of that stuff, *e.g.*, pitch or porphyry.

How this stream of striving and thinking proceeds in any individual depends partly on sensations impressed by the external world, but also partly on internal factors. Certain of the latter are of particular importance, because their character determines the direction of the stream. To these factors the name *Feeling* is technically restricted. Pleasantness and painfulness, and unnamed characters intermediate between these, clearly play a great part in controlling our behaviour, and this pleasure-pain aspect is what is generally spoken of as feeling-tone.

Where in such an account does Consciousness appear ? It cannot be too clearly realised that much of what is quite properly to be called mental activity is not conscious. Only some of the elements involved have the peculiar character which we name conscious. These elements are perhaps reducible to two kinds—*Sensations* and *Images*. Sensations are modifications of the organism, due to stimuli from outside the body, *e.g.*, in vision, or to the stimulation by one part of the body of another. A toothache, or a colic, is essentially the same in its origin as the sensation obtained, *e.g.*, by clenching the fist. The importance of these sensations due to the action of one part of the body or another will be clear when we come to discuss *emotions*.

It is obvious that not all effects of stimuli on the organism are, or give rise to, sensations. What may be the difference between effects which give rise to sensations and those which do not, is a matter upon which no light has yet been thrown. It illustrates the relative unimportance of the idea of consciousness in psychology that this problem is rarely discussed. Consciousness is supposed to be associated with the higher or more central parts of the nervous system, the bringing in of these higher systems being known as the act of *attending*. It is plain that attention alone may suffice to make conscious what has hitherto been present but unperceived. If we keep our eyes motionless, we can discover, by merely attending to the edges of the field of view, that we are all the time seeing far more than we are ordinarily conscious of seeing. Thus at all times there is a large field of inattention which is affecting us without causing consciousness, and an interesting attempt has been made by Mr. H. R. Marshall in his work on *Consciousness* to identify the "field of inattention" with what is usually called the Self.

The other kind of element which appears in consciousness is the *image*. A great deal of work has been done on images since Galton's *Inquiry Concerning the Human Faculty* drew attention to the vast range of difference between individuals both as to the images they habitually employ, and as to their powers of forming imagery of any kind. There are psychologists, such as Professor Watson in his *Behaviour*, who deny that any kind of imagery is necessary, or indeed occurs at all. There is also an interesting controversy as to how far thought can be conducted without it. The chief kinds of imagery hitherto enumerated are visual, auditory, tactual, olfactory, gustatory, motor, kinæsthetic, thermal and organic. In fact, images corresponding to every kind of sensation can be formed.

One of the most striking instances of the possibility of applying psychology to practical affairs is the educational significance of modern views on imagery. It is of little use appealing to children of an auditory type by metaphors or diagrams suitable to visualisers; and if, as seems probable, various abilities depend largely on the possession of special powers of imagery of one type or another, it should eventually be possible to avoid much disappointment and waste of time due to the early selection of unsuitable occupations.

These great differences between the type of imagery which is employed by different people raise a special problem, as to how far people with different imagery can be said to have the same thoughts. If my consciousness is filled, say, with mental pictures (visual images) and your consciousness is filled with the mental echoes of the sounds of words, how can we be said to have the same thoughts? And yet there is plainly a sense in which people who use quite different images can be said truly to be in agreement, to be thinking similarly.

This problem, which is very important both historically and theoretically, is the same as the old question, "What is an idea?" when this question is asked in Psychology. The full answer is very complicated, but an outline may be given which shews how the difficulty we have raised, and which would result from an attempt to identify ideas with images, may be avoided.

For this purpose we require the biological notion of adaptation with which we began our account. We saw that all thinking, all mental activity is adaptation. When we have an image, the actual occurrence (which appears to us as an image) is an adaptation. It is a repetition of a previous adaptation, namely, that which we made when we had the original sensation of which the image is a copy.

Since it is an adaptation there must be something to which it is adapted. If, for instance, I am thinking by means of an image of the Dome of St. Paul's, and you are thinking by means of the words "St. Paul's," we shall each be adapted to something. If this is the same then we can be said to be thinking of the same thing, and so to be having the same thoughts, *i.e.*, adaptations, the same ideas, in spite of the difference in our imagery. Thus an *idea*, which is synonymous with a "conception," a "concept," a "notion" and a "universal," is a way of thinking applicable to something, and as is implied by the term "adaptation," all "thought" may be regarded as determined by the necessity of reacting to situations and as directed towards action of some kind or other.

We may now, keeping this idea of adaptation in our minds, turn again to striving, instincts, and the emotions. According to a view which leads to a great simplification in psychology and is named after its first and most prominent exponents, the James-Lange theory, the distinctive feature of emotional as opposed to other experience is the presence of certain sensations due to physiological changes in the main tissues and organs of the body. Different groups of these give their special characters to the distinct *emotions*, such as anger, fear, disgust, or wonder.

It must not be supposed that these sensations are all that constitutes such an emotion as anger. We have to examine the causes to which the sensations themselves are due. We then find that there are a small number of primitive *instincts*, innate arrangements of the organism, which lead it to respond to typical situations in a specific fashion. Thus if a jaguar rushes suddenly upon us, our instinctive adaptation takes the form of *flight*. But to facilitate flight the internal conditions of the body, the heart-beat, the breathing and glandular changes, are modified; and these modifications give rise to the sensational part of the emotions above indicated. In other words, we are sorry, as James put it, because we cry, rather than *vice versa*. On the other hand a fly in the eye will make that organ water, but we do not necessarily experience grief. That is to say it is only bodily sensations, instinctively originated, which constitute emotions or "affects" as they are often called by modern writers. In some such way as this the chief objection to William James' view, namely, Professor Stout's contention that a stomach-ache is not an emotion, is avoided.

The accepted classification of fundamental instincts, or conative tendencies, inherited modes of striving or acting, are the following:

Flight (fear).
Pugnacity (anger).
Repulsion (disgust).
Parental instinct (tenderness).
Reproduction.
Feeding.

Curiosity (wonder).
Self-assertion (elation).
Self-abasement (subjection).
Gregariousness.
Acquisition.
Construction.

This is Professor McDougall's classification. Names for the emotions which accompany the instincts which he thinks it possible to distinguish, are not easily discovered, and he finds himself forced to omit some. The subject clearly requires more discussion than it has received, before any such list can be regarded as more than provisional. If feeding, for example, why not sleeping ? If constructiveness, why not destructiveness ? Further, it is fairly clear that instinctive activity may be unaccompanied by emotion in the sense in which we have used the term. Many, however, would maintain that emotions do accompany such instincts even when not consciously experienced, but " in the unconscious " to which we may now turn.

It is the recognition, chiefly since the opening of the present century, that most of our mental life has not the character of consciousness which is responsible for much of the present popular interest in the subject. The laws of the inter-connexions of conscious elements had been elaborately studied a hundred years ago by writers like Hartley, and already by the time of John Stuart Mill it seemed unlikely that much more could be added. Authorities like Bain were producing definitive treatises on the intellect and the emotions, and, though there were sporadic attempts to found a science of animal psychology and laboratory methods were being developed, it hardly appeared possible to do more than put the finishing touches on so monumental a structure.

At this point morbid psychology, through the work of medical men and alienists, began to force upon the attention of the official representatives of the science the necessity for fresh hypotheses.

As so often, advance was due to the fresh stimulus provided by strange occurrences for which accepted theories could suggest no explanation. Hypnotism, alternating personalities, automatic writing and psychical research, hysteria, phobias and neuroses in general, particularly those relating to sex, became the central points of interest. Resemblances between the phenomena of dreams and those of mental diseases led to a completely new account of what happens in the mind when conscious control is relaxed.

The facts thus brought to light show that only a small part of our mental life is under conscious control, *i.e.*, controlled by processes accompanied by consciousness. This has emphasised the fact that consciousness is the exception rather than the rule in the processes studied by psychology. In dealing, however, with 'The Unconscious' which is becoming too ready a resource in psychological difficulties, the first necessity is to decide as to the precise way in which we are going to use our language. Most discussions of the unconscious proceed as though there were two distinct realms, the conscious and the unconscious; as when it is said that what was in the unconscious can be brought into consciousness or what is conscious may be repressed into the unconscious. The mind is thus regarded as composed of separate strata, and in addition to the Unconscious, we hear of the Sub-conscious, the Pre-conscious, the Fore-conscious and so forth. This metaphorical language is convenient for some purposes, but no clear understanding of the problems can be reached unless we are prepared to go behind such verbal devices.

When we say that under certain circumstances (hypnosis, word-association tests, or dream-analysis) we are able to recover from the unconscious repressed memories of early childhood, or to liberate portions of experience, we are apt to forget that for other purposes we can describe the facts quite differently. We say, for example, that we can remember what we have not hitherto remembered; and when asked what we mean by remembering we reply, still without bringing in the unconscious, in terms of the effects of past experiences or our present behaviour. And in doing this we are not only avoiding the *word* "unconscious" but a certain idea or hypothesis. The word "unconscious" is, indeed, only useful when deliberately used by way of metaphor, *i.e.*, so as to avoid this idea. What is the idea in question? The answer leads us to the heart of the problem.

We may say of the physical world, of a stone, for example, that it is unconscious, *i.e.*, not conscious at all in any fashion. But in psychology the unconscious is often used to mean "conscious but not in my personal consciousness." Thus a common argument runs as follows:

"There can be no doubt at all that there are processes of which we are not personally conscious or aware—processes of exactly the same kind as those from which we infer consciousness in other people. Intelligent behaviour for example. If we are not entitled to call such processes conscious, we have no evidence of conscious process anywhere except in our own immediate consciousness." As an instance, when a clock, of whose ticking we have not been aware, stops we will often notice the change. Obviously, though we were not aware of the ticking, it must have been exercising some kind of influence on us. We are asked to suppose that "we must have been *conscious* of it below the threshold of personal consciousness," *i.e.*, we are asked to suppose that there is some other kind of consciousness, namely unconsciousness, which is not personal consciousness.

In the first place we have no direct evidence for any other than ordinary, or what is here called personal, consciousness. The argument from indirect evidence breaks down for the reason that, although we are justified in inferring consciousness in *other* people if they behave as we do when *we* are conscious, we are not justified in inferring consciousness in *ourselves* when we behave in like manner without experiencing it. The result has been a revival of almost mediæval views of "possession"—whereby from time to time the personality is invaded and occupied by what amounts to a separate spirit. Or as Professor Russell in his *Analysis of Mind* well puts it, "the unconscious becomes a sort of underground prisoner, living in a dungeon, breaking in at long intervals upon our daylight respectability with dark groans and maledictions and strange atavistic lusts"—his own view being that an unconscious desire is merely a causal law of our behaviour, namely "that we remain restlessly active until a certain state of affairs is realised, when we achieve temporary equilibrium. If we know beforehand what this state of affairs is our desire is conscious, if not, unconscious. The unconscious desire is not something actually existing, but merely a tendency to a certain behaviour; it has exactly the status of a force in physics."

Arising out of the metaphor of "force" in physics we have an extensive metaphorical vocabulary of impulsions, resistances, impacts, pulls and pushes, which at a certain level of analysis have their usefulness, but are carefully excluded by the physicist from any exact statement. Similarly we may use the metaphors of "unconscious desires," "the censor," "repressed complexes," and Mr. Tansley in his popular introduction to *The New Psychology* does not hesitate to write of a dream: "The barriers of the Freudian unconscious are less tightly closed during sleep, and elements from behind these barriers, as well as ordinary elements from the fore-conscious, from the marginal zone, and from the primary unconscious may all play their part." It is hardly necessary to point out that all this language will vanish as the science advances. But just as the scaffolding erected by builders is often more interesting to the public than their final architectural achievements, so the psychology of desire and memory in its early stages has lent itself to a picturesque treatment which, now that its work has been done, can profitably be discarded.

There is thus reason to expect that many phenomena for which the most desperate hypotheses have been required will be found to be explained by quite reasonable scientific assumptions. *Dreams*, for example, are being shown to bear the closest resemblance to many normal forms of conscious thinking. Dreaming is, in fact, a metaphorical or symbolical mode of thinking, allowing the analogies upon which metaphor depends to be so strained and far-fetched that the fully awakened mind is often entirely unable to recognise what has been the subject of thought. Now thinking, as was pointed out above, never takes place without desire or striving of some sort—thinking being the *form* taken by conation. Thus the unrecognisable form or expression of the desire active at the time is what characterises dreaming, rather than any suppression or censorship of the desire itself.

Similarly no fresh factors or strange hypotheses are required to deal with the phenomena of alternating or dissociated personalities. Cases have been carefully studied in which a person has appeared to live two or even more independent lives, the memories of one being inaccessible to those of the other. In a milder form the same thing often happens in neuroses, when patients suffer from what are known as fugues, lapses into behaviour, often of an unusual kind, the memory of which escapes them. In these cases we need not suppose that there is anything actually in the personality during one phase which in the least corresponds to, or partakes of, the other phase, whether in a repressed, submerged or unconscious form—any more than the signalman who sends his train along one line supposes that there are suppressed trains rushing along the other lines on which it might have gone. It is true that in these cases we have an unusual multiplication of tracks, but we have only one train. Similar considerations apply to hypnosis and to automatic writing, and when this is realised one set of extended principles will be found to cover both traditional psychology and the newer developments.

While dealing with the nature of consciousness it remains to mention that the answer to the primary question, " Is there a mind ? " is still undecided. There are four main answers :

(1) There is the view of the Behaviourists and Materialists that what appears to be mental is in reality physiological processes. Thinking, for instance, is sub-vocal talking—minimal muscular movements in the organs of speech (Watson, *Behaviour*, *passim*), or as the neurologists would put it, " As soon as 'mental states' are resolved into reflexes among some of the 10,000,000,000 cortical neurons, it becomes obvious that the word 'mind' is no more than shorthand for neuronal action and interaction when influenced from the outside or by internal stimuli " (Morley Roberts, *Warfare in the Human Body*, p. 229).

(2) The Animists reply that whatever may be the status of these material phenomena there is a mind or soul also, affected no doubt by the body but likewise affecting it. This interactionist view is advocated in McDougall's *Body and Mind*.

(3) Various hypotheses have been devised to avoid either of these opposed positions :

  (*a*) Parallelism, by which, although mind and body do not affect one another, every event in the higher nervous system is supposed to be accompanied by a mental event, and *vice versa*.

  (*b*) Epiphenomenalism, according to which, mind would be a by-product of neural process, not reduceable to such process but still quite unable to affect it. This, perhaps sombre, view has lately receded somewhat in favour of (*c*).

(*c*) A view by which both mind and brain would be equally real, both what we experience and what others looking into our heads could presumably observe being equally signs of some more fundamental happenings. The very same event which *appears* to me as my thought, appearing to you, if at all, as neurons in agitation. The disadvantage of such a double-aspect hypothesis is that the fundamental happenings are left in such obscurity.

(*d*) To avoid such unknowables a new set of suggestions has recently been put forward by Professor Russell, mind being reduced to sensations and images, and these regarded as probably reduceable to physiological events. At the same time his treatment of matter turns the universe into sense-data and sensibilia. Thus the two suggestions meet in a kind of neutral stuff, those changes in this stuff which follow psychological laws being mental, those which follow physical laws being physical. Much interest is certain to centre round this view, which is, however, far from representing a stable position.

It is fortunately not necessary for psychology to assume any one of these hypotheses in order to continue its work, any more than physics needs the aid of metaphysics. The most interesting thing about these meta-psychologies is the extreme degree in which they resemble one another when fully stated. A fact which suggests that their remaining apparent differences may be due merely to the language in which they are stated.

Having now described the main features of the science of Psychology, we may turn to the question of its use. Since society is composed of human beings, it is not surprising that most topics of social importance and interest have their psychological side. Our knowledge has, however, only recently reached a stage at which it can be of assistance in this sphere. In some branches uncertainty still prevails. Thus to deal with the differences in behaviour of individuals considered as members of different groups, some writers, notably Professor McDougall in his study, *The Group Mind*, favour the suggestion of a group mind or collective spirit. The difficulties raised by this view, *e.g.*, what happens when a new member joins the group, are regarded as far outweighing its advantages by those who hold that a wood is nothing more than the trees of which it consists, and that the methods of individual psychology are as sufficient in social psychology, as is the study of individual trees (modified doubtless by their environment) in forestry.

The main ways in which the members of a group influence one another, are through their common use of language, and through imitation. A striking, if somewhat bizarre, treatment of the social aspects of language will be found in a volume entitled *Psyche's Lamp* by R. Briffault, while Taine is still the most readable advocate of the influence of imitation.

It is hard to find any branch of human activity upon which psychology cannot throw fresh light. The practice and theory of education owe most of their recent developments to our increasing knowledge of mental laws. The study of mental processes in childhood and infancy has led to new methods like those of Dr. Montessori, while in a variety of special problems such as the acquisition of language discussed by O'Shea (*Linguistic Development*) much fruitful material is being made available.

The control of attention also, the function of apperception or assimilation in determining interest, and the technique of memorisation are instances. Contrary to expectation, experimentalists have come to regard it as proved that it is easier to memorise passages as wholes rather than piecemeal. The conditions and effects of fatigue are of obvious importance here and wherever, as in industry, efficiency or output are an essential consideration. It is becoming recognised that there is no more decisive factor in securing that time is spent to the best advantage than the judicious arrangement of rest-intervals and spells of work. In industry too, as in education, the problem of specialisation, of endowments and aptitudes, is in urgent need of investigation. Intelligence tests are being devised, of which an account is given in Stockbridge's *Measure your Mind* and in Maxwell Garnett's notable work, *Education and World Citizenship*. Further, the analysis of character so fundamental for all educational progress has also been greatly advanced of recent years by Mr. A. F. Shand (*The Foundations of Character*) and others.

The psychological understanding of character is closely allied to the direction of impulse, motive and desire, and so to the formulation of aims and ideals. What we value, what has "affective volitional meaning" for us, and why we value it are formidable psychological problems which few have ventured to explore, though such a work as Urban's *Valuation* breaks much new ground, in the fields of economics and æsthetics as well as in ethics. It is not often realised, for instance, that when we discuss poems or pictures we are dealing with almost purely psychological objects. *Paradise Lost*, 'La Gioconda,' and 'The Magic Flute' are, æsthetically, sets of sensations, images, emotions, impulses and thoughts which we experience. The selection of some of these experiences and the rejection of others as too unlike those which the standard reader or listener, or ideal man, could experience, raises through its appeal to mental health issues equally dependent on our knowledge of the mind.

Finally, a knowledge of general psychological principles is requisite for any attempt to investigate the alluring and important problems of telepathy, materialisation and mediumship, studied under the general heading of Psychical Research, in their bearing on survival. Herewith we reach the limits of this outline, and those who wish to pursue the study further will, it is hoped, find sufficient indication of the most interesting material for their purpose in the works mentioned in the course of the discussion.

NOTES AND NEWS

THE most interesting recent event in the psychological world is the appointment of Dr. William Brown, M.D., D.Sc., to the Wilde Readership in Mental Philosophy in the University of Oxford. Dr. Brown has held the position of Reader in Psychology in the University of London since 1908 and is well known as the author of *Mental Measurement* (Cambridge University Press). His latest book, *Psychology and Psycho-therapy*, has also attracted much attention, for he has had an extensive experience of war neuroses and their treatment. He acted as Consulting Neurologist to the British Armies in France and saw a great deal of psycho-therapeutic work, both in battle areas and behind the lines. He was also in charge of the Craiglockart hospital for a considerable period.

The Wilde Readership was last held by Dr. William McDougall, F.R.S., who is now Professor of Psychology at Harvard University. The terms of the original bequest require the Reader to lecture on the principles of Mental Philosophy as deducible from Observation and Experience, in contradistinction to Experimental Psychology. Subsidiary functions of the Reader are to lecture on certain aspects of anthropological psychology and on the illusions and delusions which beset the human mind.

Doctor Brown hopes to do justice to all aspects of Psychology, while not omitting to pay full attention to modern developments on the medical side, and it will be widely agreed that his experience of general psychology and psycho-therapeutics, combined with his independence of view, well qualify him for the task.

Readers of *Psyche* will, we are sure, join with us in congratulating Dr. Brown on his appointment, and in wishing him every success in his new undertaking.

WE hope in future numbers of *Psyche* to make a strong feature of notes on the work which is being done in the various psychological laboratories, both in England and abroad. We believe that this will prove of value to all who are actively engaged in psychological studies, not only by preventing unnecessary duplication of effort, but by enabling those who are working at the same subjects from different points of view or by different methods to get in touch with each other, if they wish to do so, and to compare notes to their mutual advantage.

We cordially invite all who are engaged upon research work, and especially Directors of Laboratories, to forward general particulars of experiments which are in progress or projected, together with summaries of results obtained and any other details which are available for publication. We add below a few notes from Manchester, London, and Cambridge.

At Manchester Mr. Frank Watts, whose recently published book is reviewed below, is working on various problems in vocational selection and is devising and applying tests in connection with this subject.

Mr. F. M. Earle has just completed an experimental investigation of some differences between the mentality of blind, blinded, and seeing children, with special reference to the educational implications of this subject. The results will be published shortly.

Professor T. H. Pear is engaged upon a book dealing with the processes involved in remembering, forgetting, and dreams. He is also working at various aspects of the problem of the acquisition of skill.

At King's College, London, much work of a psycho-therapeutic nature is always in progress in connection with King's College Hospital. In addition to this Dr. R. J. Bartlett has been investigating the subject of Memory with special reference to affective tone by an experimental method involving word-association.

Dr. F. H. Cracknell has been experimenting on Suggestibility in school-children.

The Psychological Laboratory at Leeds has only recently been organised, and there are as yet no completed researches to record. It is satisfactory to note, however, that a number of graduate students from various Universities have already registered for research, and we hope to be able to give some account of their activities in later issues.

AT Cambridge Dr. Rivers has been delivering a series of special lectures on Dreams, in the course of which he has developed original views based on his extensive experience of war-neuroses. Mr. R. H. Thouless has also delivered a special course of lectures on the Psychology of Religion, in which he has attempted to bring the phenomena of religious life and experience more closely into line with modern psychological doctrines than has hitherto been done. Mr. C. K. Ogden and Mr. I. A. Richards, who contribute an introduction to Psychology in this number, have been continuing their investigations with the Psychology of Thought and the Functions of Symbols.

On the purely experimental side the work may be described under three main heads:

(1) Experiments of general psychological interest.
(2) Experiments having industrial applications.
(3) Experiments having medical applications.

(1) The research in what may be called "pure" experimental psychology include the following:

(*a*) By W. Whately Smith: An investigation, by the psycho-galvanic reflex method, into the relation between affective processes and memory, together with an attempt to discover the modification of results induced by the use of drugs. A description of part of this work has already been published in the *British Journal of Psychology*, vol. xi., pt. ii., pp. 236-50. Further reports will be published in the Medical Section of the same journal.

(*b*) By J. P. Lowson: A study of the psychological effects of the deprivation of oxygen. This work has been carried out in the oxygen chamber belonging to the Physiological Laboratory, and in conjunction with Dr. Barcroft. It consists of the study of test performances of subjects working under conditions of reduced oxygen pressure.

(*c*) By Miss K. Banham: Experiments on the relation of affective tone to memory and association of nonsense syllables. This consists largely in a development of the work carried out on the same general topic with meaningful material.

(*d*) By Miss L. Feasey: Studies of æsthetic types in the appreciation of rectangular figures, and, by a method of construction, of similar types in the arrangement of various geometrical patterns. In both instances the experiments attempt to arrive at some conclusion concerning the relation between the actual *production* by a subject of artistic forms and his judgment of their æsthetic value.

(*e*) By Miss M. Sturt: A study of the understanding of temporal relationships by children, with particular reference to the teaching of history.

(*f*) By F. F. Young and F. C. Bartlett: Experiments on the possible effects of fatigue upon the localisation of sound. This work repeats and develops Mr. J. C. Flügel's experiments on "Local Fatigue in the Auditory System" (*Brit. Journ. of*

Psychol., vol. xi., pt. i., pp. 105-134), and is intended to illustrate certain criticisms of his results.

(*g*) By F. C. Bartlett: A new determination of the relation of intensity differences to the binaural localisation of sound; and a study of least perceptible differences in pitch over a range of high frequencies.

(*h*) By F. C. Bartlett: Certain experiments on the reproduction of stories and symbols intended to throw light upon the processes of conventionalisation.

(2) Research with industrial applications, mainly under the direction of Mr. B. Muscio, includes:

(*a*) By Miss S. M. Bevington: Modifications in the "lay out" of the compositor's case in relation to the movements involved in his work.

(*b*) By Miss M. Sturt: The relation between speed and accuracy in teaching typewriting.

(*c*) By Miss W. S. Clarke: A comparison of voluntary *versus* regulated rates of work in relation to output and accuracy.

(*d*) By Miss S. C. M. Sowton: The development of vocational tests for typists.

(3) Research which is largely of Medical Interest is the investigation by Dr. E. Prideaux into the nature and conditions of the psycho-galvanic reflex, with particular reference to the way in which, if at all, it may be taken as an expression of emotion. Into this class also falls Miss L. Fildes' research on mentally defective children, carried on at the Littleton House School, Girton.

THE postponed meeting of the British Psychological Society will take place at Cambridge on July 23rd. The principal papers to be read are one on Methods of Dream Analysis, by Dr. W. H. R. Rivers, F.R.S., and on Sentiments, by Dr. C. S. Myers, F.R.S. In addition the Research Students of the Laboratory will give demonstrations of their methods and results.

MR. GARDNER MURPHY, of Concord, Massachusetts, U.S.A., hopes shortly to undertake a prolonged series of experiments in Telepathy in connection with the Hodgson Memorial Fund. He proposes to pay special attention to the transmission of ideas over long distances and is anxious to get into touch with interested persons in any part of the world who would be willing to co-operate in this work.

In view of the many criticisms which have been brought against much of the evidence for telepathy on the ground of the probable hyperæsthesia of the percipient, this seems to be a very wise decision and it is greatly to be hoped that these experiments will throw further light upon the obscure issues involved. Mr. Murphy has recently been engaged upon lecturing and research work at Columbia University and thus has the advantage of a thorough psychological training in addition to an extensive knowledge of previous experiments in telepathy.

PSYCHICAL RESEARCH at Copenhagen.—The Danish Society for Psychical Research has decided to hold a Congress at Copenhagen from August 26th to September 2nd inclusive, at which papers will be read and problems discussed. Invitations have been addressed to prominent students of the subject throughout the world, and it is hoped that a thoroughly representative gathering will assemble. The promoters consider that the slow progress which is being made is largely due to insufficient co-ordination of the work of scattered investigators, and that a central clearing-house of information would be of value. The chief object of the Congress is to bring students from different parts of the world into touch with each other and so to inaugurate a *régime* of closer co-operation. The organising secretary is Mr. Carl Vett, to whom all communications should be addressed, C/o The Psychical Research Congress, Copenhagen.

THE TUDOR-HART THEORY OF COLOUR

(COMMUNICATED)

*[The following communication is made by a writer who has studied exhaustively the various theories of Colour Harmony and Standardisation which have been put forward from time to time. Although it deals only with one particular example of research, it should be useful as a general introduction to this important subject, which we propose to discuss more fully in subsequent issues.—*ED. *Psyche.*]

THE laws of Colour are of importance not only to artists as commonly understood, but also to dyers, dressmakers, ophthalmologists, chemists, florists, philatelists, decorators and brewers. In view of this it is rather surprising that so little effort, comparatively, has been made to elucidate the principles which govern the use of colour and to reduce them to a definite form available for æsthetic, commercial, or educational purposes.

Among recent investigators of the subject Mr. Tudor-Hart stands preeminent. He has brought the technique of standardising colours to a remarkably high pitch of perfection, and has worked out the laws of colour relationships with great success. This technique, founded on the close analogy which exists between Colour and Sound, has already proved of the utmost practical value, both educationally in Mr. Tudor-Hart's studio and as the basis of his strikingly successful work on camouflage during the war. There can be little doubt that if the potentialities of the scientific treatment of colour were better known the principles evolved would find innumerable applications of great importance.

Meanwhile Professor Ostwald in Germany has been working on similar lines and has recently published a number of works dealing with the subject.[1] In these Professor Ostwald has very properly concerned himself primarily with producing a complete system of colour-standards, for this is an indispensable preliminary to the scientific study of colour relationships. It must be admitted that in this attempt he has enjoyed a greater measure of success than has attended any of his predecessors, such as Munsell, Ross, or Lovibond, for his work is clear and consistent. It has, moreover, already achieved a considerable success in Germany, where the importance of applying scientific methods to æsthetic problems is, perhaps, more widely appreciated than in this country.

Unfortunately Professor Ostwald's work is vitiated by the fact that he has made certain small but all-important errors in the initial stages.

The standardisation of colour must always depend upon the preliminary production of a satisfactory " neutral scale " ; a series of tones, that is to say, ranging from dead black to pure white through varying shades of grey. This is essential because, without it, complementary colours cannot be determined precisely, and unless this is done one is left without accurate *points de depart,* so to speak, for the construction of a range of hues.

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[1] *Die Farbenfibel:* a primer with hand-coloured diagrams. *Die Harmonie der Farben. Farbennormen und Farbharmonien. Die Farbenlehre* (Vols. I & II; other volumes in preparation). *Einführung in die Farbenlehre. Die Farbschule. Goethe, Schopenhauer und die Farbenlehre.* And a variety of apparatus, colour atlases, etc. Most of them can now be obtained in England.

Professor Ostwald has made the grave error of assuming that any mat black pigment is a pure neutral black, whereas, as Mr. Tudor-Hart has clearly shown, all the black pigments of commerce are deep tones of red or orange and, therefore, when lightened with neutral white, give greys which are warmer than the true neutral. Similarly Professor Ostwald speaks of barium sulphate as if it were an ideally neutral white, whereas it is really a very weak orange ; zinc white, also, reflects a faint greenish light, and this is not mentioned.

Now complementary colours, the determination of which is vital to any scheme of colour-standardisation or to the elucidation of the laws of colour harmony, are defined as those which by their mixture produce a neutral grey tint. The only method of determining them is by adjusting them until when mixed they precisely match a previously standardised tone of neutral grey. It is obvious that unless the latter is truly neutral the colours concerned cannot be selected so as to be truly complementary.

The result has been that many of Professor Ostwald's standardised colours are seriously at fault. Thus he gives in his *Primer* a colour-circle in which pairs of complementary colours are supposed to lie at opposite ends of diameters of the circle. But for the reasons mentioned above only one pair is correct, the others being anything from three to twelve intervals out. The pairs of colours given as complementaries tend, in consequence, to give a grey warmer in tone than the true complementaries would do, and this not only renders his colour scale of little value but also vitiates any conclusions which he draws regarding colour relationships.

He believes, for example, that complementary colours are harmonious, but this erroneous result is due to the fact that he is not really dealing, as he supposes, with true complementaries at all. It is interesting to note that he is distinctly uneasy when, by accident, his standardisation happens to be correct and the resulting complementaries are discordant.

Another point on which his exposition is weak is his failure to realise the fact that a given hue can only "saturate" (*i.e.*, attain its maximum degree of purity) at one particular luminosity (brightness). And yet he justly observes that hue is altered by change of luminosity ; orange appearing more red where its brightness is reduced and true dark yellows appearing as dull greens.

It is errors of this kind, it would appear, which lead him to reject the analogy between Colour and Sound which Mr. Tudor-Hart has so successfully worked out. This analogy, which has appealed to many students ever since the days of Newton, depends, first, on a precise standardisation of colour (which Professor Ostwald has just failed to achieve), and, second, on the correct correlation of the variables which determine sound and colour respectively. Each can vary in three ways : Sound in respect to Pitch, Loudness, and Quality, and Colour with regard to Luminosity (brightness), Saturation (purity), and Hue (colour, *e.g.*, red, blue, green, yellow, etc.).

Mr. Tudor-Hart finds, as a result of laborious researches extending over many years, that if these variables are once rightly related to one another (luminosity to pitch, saturation to loudness, and hue to quality) it is possible to transpose from musical harmony into colour harmony without change. That is to say, the colour analogue of a harmonious musical chord will also be harmonious and *vice versa.* Moreover, which is even more remarkable perhaps, the emotional effects produced by the colour analogue will be equivalent to those produced by the musical chord itself.

This discovery, into the ramifications of which it is not possible to enter here, opens the way to a new treatment of colour problems. It makes possible the production of a standardised colour notation whereby all who are concerned with the handling of colour may refer unambiguously to just that hue, saturation, and luminosity which they have in mind. The value of such an advance for practical work can hardly be over-emphasised, for the colourist will at last be as favourably placed as the musician with regard to technique and the manipulation of his medium; and the vague, even when correct, intuitions of artists will be capable of fixation in determinate form, in the same fashion as are the inspirations of musical composers.

This ideal may still be remote, but Mr. Tudor-Hart's work has unquestionably done more than that of any contemporary student to indicate how it may be attained.

SURVEY OF CURRENT LITERATURE

[*As announced in our Editorial, we have made special arrangements, in response to numerous suggestions, whereby any books recommended or mentioned in our pages, as well as other psychological works, can be obtained with the least possible inconvenience and delay from* The Cambridge Magazine Bookshops (Psychological Dept.), 6, Kings Parade, Cambridge. *The proprietors have kindly consented to a scheme whereby readers of* Psyche *need not forward a remittance with every order; a system which is calculated to save much correspondence and annoyance at a time when, through abnormal trade conditions, books are so constantly out of print or rebinding.*—ED. *Psyche.*]

PERIODICALS

The British Journal of Psychology (General Section) for April, 1921, starts with a paper by David Forsyth on " The Infantile Psyche," in which he discusses: Visual hallucinations in childhood: The revival and exterior projections of visual memories: The supernatural in childhood: Psychic reality and objective reality; pleasure and reality principles: Magic and the belief in spirits and demons: Projection of feeling: Rationalisation and magic.

H. Hartridge, in " A Vindication of the Resonance Hypothesis of Audition," describes experiments which indicate the validity of this hypothesis in spite of the criticisms which have been brought against it by Perrett, Wrightson, and others.

J. C. Flügel contributes " A Minor Study of Nyctopsis," and this is followed by " A Method of Measuring Nyctopsis, with some results," by Ll. Wynne Jones.

F. C. Bartlett writes on " The Functions of Images," based on a long series of experiments. The experimental methods are described and the results dealt with under the headings of: The general influence upon sensory imagery of affective factors; The main characteristics of direct sensory imagery; How the use of words affects direct sensory imagery.

The *Psychological Review* (March, 1921) has papers on " Cerebral Mental Relations," by S. I. Franz; " The Misuse of Instinct in the Social Sciences," by L. L. Bernard; " An Attempt toward a Naturalistic Description of Emotions " (II.), by J. R. Kantor, and " On the Organisation of Intellect," by Prof. Thorndike.

The *Journal of Philosophy* (May, 1921) has articles by J. R. Kantor on " A Tentative Analysis of the Primary Data of Psychology," and by W. R. Wells on " Is Supernaturalistic Belief Essential in a Definition of

Religion ?" Also on "'Crises' in the Life of Reason," by T. M. McClure; the "Co-ordinate Character of Feeling and Cognition," by M. Picardo; and "The Basic Assumption of Experimental Science," by F. Russell Bichowsky.

The most interesting paper in *The Training School Bulletin* (April, 1921) is by E. A. Doll on "Criminal Psychology."

The *Journal of Educational Psychology* (April, 1921) contains a paper by Thorndike on "The Psychology of Drill in Arithmetic: the Amount of Practice." Also a Symposium on "Intelligence and its Measurement" by six authors, and articles on "The Relationship between Eye-perception and Voice-response in Reading," and "Prophecy of Learning Progress, by Beta," by G. T. Buswell and Garry C. Myers respectively.

Some interesting observations on anthropological researches in the San Juan area are made by E. H. Morris in the latest number to hand of the *Proceedings of the National Academy of Sciences of the U.S.A.*

The *Journal de Psychologie* (January, 1921) publishes papers by Delacroix on "L'automatisme dans l'imitation"; by Janet on "Les oscillations de l'activité mentale"; by Paulhan on "Le psychisme inconscient"; and by Gilles on "Le phénomène du deja-vue."

The *Journal of Comparative Psychology*. The principal paper is one of ninety-four pages on "Integration of Movements in Learning in the Abino Rat," by J. L. Ulrich. A smaller paper by English Bagby deals with "The Psychological Effects of Oxygen Deprivation."

Internationale Zeitschrift für Psychoanalyse, 1921, No. 1.—Prof. Jelgersma of Leiden publishes his address to the 1920 Hague Congress, on the Theory of Feeling. A. Starcke deals with the Castration Complex, and Dr. Ferenczi contributes a psycho-analytic account of Tics. No. 2 contains articles on clinical Psychiatry, Insomnia, and the Psycho-Analysis of Children.

Arbeiten zur Entwicklungspsychologie, 1921. No. 5 is devoted to a treatise by Dr. Freyer on the attitude of nineteenth-century thinkers to economics.

Zeitschrift für Psychologie, 1921, vol. lxxxvi., Nos. 4 and 5, continue the analysis of Space-perception, and A. Hofler gives a useful summary of Meinong's Psychology. Meinong, whose death occurred last November, was one of the editors of the *Zeitschrift*, and a posthumous summary of his general position appeared in a volume published by the firm of Felix Meiner early this year.

Zeitschrift für angewandte Psychologie, Monograph 25.—David Katz on the Psychology of Amputated Patients. *Monograph* 26.—Vocational Selection and the School, by Erich Stern.

Psyke (Danish) has for its principal item an article by Professor Alrutz of Upsala, in which the author defends the "effluence" versus the "psychical" theory of "mesmerism."

Psyche's Lamp. By ROBERT BRIFFAULT. (Allen and Unwin, 1921. 12s. 6d.)

An author who claims to have proved a theory which "abolishes death, for what does not exist cannot cease to exist" is at least making a claim on the attention of students of psychic research; and Mr. Briffault, whose book is likely to interest a wide public, is particularly worth discussing because he contrives to introduce into his argument so much incidental matter which is valuable on its own account. The reader will be well advised not to be prejudiced by the Introduction, in which amongst other things he is informed that "epistemologically the inner world of mind 'contains' the entire universe," but to consider on their merits such chapters as those on Organic and Inorganic action, and the Organism and consciousness in which an able and lucid attempt is made to interpret modern bio-chemical and histological hypotheses.

Mr. Briffault begins by reducing conscious purpose to mere mechanism in the service of a "primary conative tendency" (p. 185 ff.), apparent equally in all forms of life, and for him the important fissure is between the organic and inorganic rather than between consciousness and matter. The tendency active in one organism is part of the general tendency active in Life as a whole. Thus the disappearance of a single organism is insignificant, and it is our preoccupation with particular organisms, ourselves, which has led to the false concept of personal individuality with its corollary, the problem of death.

All this clearly has affinities with the writings of Bergson and with the recent speculations of Mr. Russell and others, but Mr. Briffault does not offer any detailed analysis of our ordinary modes of behaviour. He adds, however, a final argument, drawn from linguistic considerations and similar to that which has led to the scepticism of Manthuer and other ultra-nominalists. On the one hand our actuating impulses, our feelings, instincts, etc., derive from our organic ancestry; they are currents in the river of life, and subserve the well-being of the organism. On the other our soul, our humanity, our human consciousness "is entirely derived from the collective social environment," not by way of descent but by assimilation; it "enters our being mainly by means of words," and is the product of an "abstraction," since "society" to whom we owe it is made up of souls similarly manufactured. It is a pity that an author who displays such a lively understanding of the nature and dangers of symbolism (pp. 85 and 203) should at so critical a point have lapsed into vagueness and metaphor. Even if "society" is an "abstraction" the members of a society, the aggregate, do not form an abstraction. No doubt the human mind is socially conditioned, but this does not make it a social *creation*, nor if it were a social creation would the question of its existence and survival be ruled out. It only remains to add that Mr. Briffault's style is engaging, and that he is not afraid of linguistic innovations—though incardinate (p. 86), mawl (p. 84) and spacial (p. 13) seem to require attention.

O. R.

An Introduction to the Psychological Problems of Industry. By FRANK WATTS, M.A. (Allen and Unwin, 12s. 6d.)

There is really very little to say about this book except to describe its contents and to add that it is well written, suitably produced, and full of good, sound stuff. Mr. Watts is Lecturer in Psychology in the University of Manchester and in the Department of Industrial Administration of the

College of Technology in that city. He also has a considerable first-hand knowledge of the practical application of his subject.

His book begins with a short survey on the Psychological Point of View in Industry, which forms an admirable introduction to the main part of the work. He then deals in order with Fatigue and Inefficiency, with Motion Study, and with Vocational Selection. This concludes the treatment of what may be termed the more mechanical aspect of the subject.

A chapter on Scientific Management and Labour forms a natural stepping-stone to the last two chapters, which deal with broader issues under the headings of Industrial Unrest and the Creative Impulse in Industry.

The fact that in this last chapter the author discusses such topics as the Decline of Craftsmanship, Recreation, and Ideals in Industry shows that he is alive to issues more vital than mere increase of efficiency as such, and to those all-important factors which cannot be expressed in terms of percentage, gain, or loss.

It is this breadth of view, perhaps, which one especially admires and which makes the book so much more valuable than others which confine themselves to the immediate and practical problems of increasing output.

The book is one which we unhesitatingly recommend to all who are interested in the subject, whether as industrialists or from the psychological point of view. It can be read with equal profit by those who are not specialists in either of these subjects, or directly concerned with them ; but who wish to acquaint themselves with what is now being done and may in the future be reasonably expected in a field of vital importance to the nation as a whole and to every individual in it.

W. W. S.

ALSO RECEIVED

[*Notice in this column does not necessarily preclude subsequent detailed reviews.*]

The Psychology of Day-Dreams. By DR. VARENDONCK. With an Introduction by Prof. Sigmund Freud. (Allen and Unwin, 18s.)

Man's Unconscious Spirit : the Psycho-Analysis of Spiritism: By WILFRED LAY, Ph.D. (Kegan Paul, 10s. 6d.)

Education and World Citizenship. By MAXWELL GARNETT. (Cambridge University Press, 1921, 36s.)

The Mneme. By RICHARD SEMON. (Translated by L. SIMON, 1921. Allen and Unwin, 18s.)

On Nature of Existence. By J. E. McTAGGART. Vol. I. (Cambridge University Press, 1921, 22s. 6d.)

The Analysis of Mind. By BERTRAND RUSSELL. (Allen and Unwin, 1921, 16s.)

Logic, Part I. By W. E. Johnson. (Cambridge University Press, 16s.)

Fijian Society. By the Rev. W. Deane. (Macmillan, 1921, 16s.)

Divine Imagining, an Essay on the First Principles of Philosophy. By Douglas Fawcett. (Macmillan, 15s.)

Measure Your Mind. By F. P. Stockbridge and M. R. Trabue. (Harrap, 1921, 10s. 6d.)

Activism. By H. L. Eno. (Princeton University Press. London, Milford, 1921, 6s. 6d.)

The Psychology of Everyday Life. By James Drever. (Methuen, 1921, 6s.)

The Psychology of Industry. By James Drever. (Methuen, 1921, 5s.)

The Psychology of Behaviour. By Dr. Elizabeth Severn. (Stanley Paul, 8s. 6d.)

Neither Dead nor Sleeping. By May Wright Sewall. (Watkins, 7s. 6d.)

The Great Demonstration. By Katharine Roof. (Appleton, 8s. 6d.)

D. D. Home, His Life and Mission. By Mrs. Douglas Home. Edited by Sir Arthur Conan Doyle. (Kegan Paul, 9s.)

Masonic Legends and Traditions. By Dudley Wright. (William Rider, 5s.)

True Tales of the Weird. By Sidney Dickinson. With an Introduction by R. H. Stetson and a Prefatory Note by G. O. Tubby. (Duffield. No price given.)

An Amazing Séance and an Exposure. By Sydney A. Moseley. (Sampson Low, 3s.)

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